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MILITARY SPECIFICATION

MICROCIRCUITS, DIGITAL, CMOS, NAND GATES

MONOLITHIC SILICON, POSITIVE LOGIC

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the detail requirements for monolithic silicon, CMOS logic microcircuits. Two product assurance classes and a choice of case outlines and lead finishes are provided and are reflected in the complete part number.

1.2 Part number. The part number shall be in accordance with MIL-M-38510.

1.2.1 Device type. The device type shall be as follows:

<u>Device type</u>	<u>Circuit</u>
01	Quadruple 2-Input NAND gate
02	Dual 4-Input NAND gate
03	Triple 3-Input NAND gate
51	Quadruple 2-Input NAND gate
52	Dual 4-Input NAND gate
53	Triple 3-Input NAND gate

1.2.2 Device class. The device class shall be the product assurance level as defined in MIL-M-38510.

1.2.3 Case outline. The case outline shall be designated as follows:

<u>Outline letter</u>	<u>Case outline (see MIL-M-38510, appendix C)</u>
A	F-1 (14-lead, 1/4" x 1/4"), flat package
C	D-1 (14-lead, 1/4" x 3/4"), dual-in-line package
D	F-2 (14-lead, 1/4" x 3/8"), flat package
X	F-1 (14-lead, 1/4" x 1/4"), flat package, except A dimension = 0.1" (2.54 mm) maximum
Y	F-2 (14-lead, 1/4" x 3/8"), flat package, except A dimension = 0.1" (2.54 mm) maximum

NOTES:

- As an exception to 3.5.6.2.3 of MIL-M-38510, for case outlines X and Y only, the leads of bottom brazed ceramic packages (i.e., configuration 2 of case outlines F-1 or F-2) may have electroless nickel undercoating which shall be 50 to 200 microinches (1.27 to 5.08 μ m) thick provided the lead finish is hot solder dip (i.e., finish letter A) and provided that, after any lead forming, an additional hot solder dip coating is applied which shall extend from the outer tip of the lead to no more than 0.015 inch (0.38 mm) from the package edge.
- For bottom or side brazed packages, case outlines X and Y only, the S₁ dimension may go to .000 inch (.00 mm) minimum.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: National Aeronautics and Space Administration, George C. Marshall Space Flight Center, ATTN: EG02 Marshall Space Flight Center, Alabama 35812, using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

1.3 Absolute maximum ratings.

Supply voltage range ($V_{DD}-V_{SS}$):	
Device types 01, 02, and 03	-0.5 V to +15.5 V
Device types 51, 52, and 53	-0.5 V to +18 V
Input current (each input)	+10 mA
Input voltage range	($V_{SS}-0.5$ V) $\leq V_I \leq (V_{DD} + 0.5$ V)
Storage temperature range	-65°C to +175°C
Maximum power dissipation (P_D)	200 mW
Lead temperature (soldering, 10 seconds)	+300°C
Thermal resistance, junction-to-case	(See MIL-M-38510, appendix C)
Junction temperature (T_J)	+175°C

1.4 Recommended operating conditions.

Device types 01, 02, and 03:

Supply voltage ($V_{DD}-V_{SS}$)	4.5 V dc to 12.5 V dc
Input low voltage range (V_{IL})	0-0.85 V dc @ $V_{DD} = 5$ V;
	0-2.0 V dc @ $V_{DD} = 10$ V
	0-2.1 V dc @ $V_{DD} = 12.5$ V
Input high voltage range (V_{IH})	3.95-5.0 V dc @ $V_{DD} = 5$ V;
	8-10 V dc @ $V_{DD} = 10$ V;
	10.0-12.5 V dc @ $V_{DD} = 12.5$ V

Device types 51, 52, and 53:

Supply voltage ($V_{DD}-V_{SS}$)	4.5 V dc to 15 V dc
Input low voltage range (V_{IL})	0-1.5 V dc @ $V_{DD} = 5$ V dc, $V_{OL} = 10\% V_{DD}$, $V_{OH} = 90\% V_{DD}$,
	0-2.0 V dc @ $V_{DD} = 10$ V dc.
	0-4.0 V dc @ $V_{DD} = 15$ V dc.
Input high voltage range (V_{IH})	3.5-5.0 V dc @ $V_{DD} = 5$ V dc, $V_{OL} = 10\% V_{DD}$, $V_{OH} = 90\% V_{DD}$,
	8-10 V dc @ $V_{DD} = 10$ V dc
Ambient operating temperature (T_A)	11.0-15.0 V dc @ $V_{DD} = 15$ V dc -55°C to +125°C
Load capacitance	50 pF maximum

2. APPLICABLE DOCUMENTS

2.1 Government specifications and standards. Unless otherwise specified, the following specifications and standards, of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation, form a part of this specification to the extent specified herein.

SPECIFICATION**MILITARY**

MIL-M-38510 - Microcircuits, General Specification for.

STANDARD**MILITARY**

MIL-STD-883 - Test Methods and Procedures for Microelectronics.

(Copies of specifications, standards, handbooks, drawings, and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

3.1 Detail specification. The individual item requirements shall be in accordance with MIL-M-38510, and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-M-38510 and herein. Although eutectic die bonding is preferred, epoxy die bonding may be performed. However, the resin used shall be Dupont 5504 Conductive Silver Paste, or equivalent which is cured at $200^{\circ}\text{C} \pm 10^{\circ}\text{C}$ for a minimum of 2 hours. The use of equivalent epoxies or cure cycles shall be approved by the qualifying activity. Equivalency shall be demonstrated in data submitted to the qualifying activity for verification.

3.2.1 Logic diagrams and terminal connections. The logic diagrams and terminal connections shall be as specified on figure 1.

3.2.2 Truth tables and logic equations. The truth tables and logic equations shall be as specified on figure 2.

3.2.3 Schematic circuits. The schematic circuits shall be submitted to the preparing activity prior to inclusion of a manufacturer's device in this specification and shall be submitted to the qualifying activity as a prerequisite for qualification. All qualified manufacturers' schematics shall be maintained and available upon request.

3.2.4 Case outlines. The case outlines shall be as specified in 1.2.3.

3.3 Lead material and finish. The lead material and finish shall be in accordance with MIL-M-38510 and 6.4 herein.

3.4 Electrical performance characteristics. The electrical performance characteristics are as specified in table I, and apply over the full recommended ambient operating temperature range, unless otherwise specified.

3.5 Electrical test requirements. The electrical test requirements for each device class shall be the subgroups specified in table II. The electrical tests for each subgroup are described in table III.

3.6 Marking. Marking shall be in accordance with MIL-M-38510. At the option of the manufacturer, marking of the country of origin may be omitted from the body of the microcircuit, but shall be retained on the initial container.

3.6.1. Total dose radiation hardness identifier. Total dose radiation hardness identifier shall be in accordance with MIL-M-38510 and 4.5.5 herein.

3.6.2 Serialization. All class S devices shall be serialized in accordance with MIL-M-38510.

3.6.3 Correctness of indexing and marking. All devices shall be subjected to the final electrical tests specified in table II after part number marking to verify that they are correctly indexed and identified by part number. Optionally, an approved electrical test may be devised especially for this requirement.

3.7 Microcircuit group assignment. The devices covered by this specification shall be in microcircuit group number 36 (see MIL-M-38510, appendix E).

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-M-38510 and methods 5005 and 5007, as applicable, of MIL-STD-883, except as modified herein.

4.2 Screening. Screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to qualification and quality conformance inspection. The following additional criteria shall apply:

- a. Delete the sequence specified in 3.1.9 through 3.1.13 of method 5004 and substitute lines 1 through 7 of table II herein.

- b. Burn-in (method 1015 of MIL-STD-883).
 - (1) Static tests (test condition A) using circuit shown on figure 3, or equivalent. Ambient temperature (T_A) shall be 125°C minimum. Test duration for each static test shall be 24 hours minimum for class S devices and in accordance with table I of method 1015 for class B devices.
 - (2) Dynamic test (test condition D) using circuit shown on figure 4 or equivalent. Ambient temperature (T_A) shall be 125°C minimum. Test duration shall be in accordance with table I of method 1015.
- c. Interim and final electrical parameters shall be as specified in table II herein.
- d. For class S devices, post dynamic burn-in, or class B devices, post static burn-in, electrical parameter measurements may, at the manufacturer's option, be performed separately or included in the final electrical parameter requirements.

4.2.1 Percent defective allowable (PDA).

- a. The class S devices PDA shall be 5 percent for static burn-in and 5 percent for dynamic burn-in, based on the exact number of devices submitted to each separate burn-in.
- b. Static burn-in I and II failures shall be cumulative for determining PDA.
- c. The class B devices PDA shall be in accordance with MIL-M-38510 for static burn-in. Dynamic burn-in is not required.
- d. Those devices whose measured characteristics after burn-in exceed the specified delta (Δ) limits or electrical parameter limits specified in table III, subgroup 1, are defective and shall be removed from the lot. The verified failures divided by the total number of devices in lot initially submitted to burn-in shall be used to determine the percent defective for the lot and the lot shall be accepted or rejected based on the specified PDA.

4.3 Qualification inspection. Qualification inspection shall be in accordance with MIL-M-38510. Inspections to be performed shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, D and E inspections (see 4.4.1 through 4.4.5).

4.3.1 Qualification extension. When authorized by the qualifying activity, if a manufacturer qualifies to a 51, 52, or 53 device type which is manufactured identically to a 01, 02, or 03 device type on this specification, then the 01, 02, or 03 device type may be part I qualified by conducting only group A electrical tests and any electricals specified as additional group C subgroups and submitting data in accordance with MIL-M-38510, appendix D (i.e. groups A, B, C, D, and E tests are not required).

4.4 Quality conformance inspection. Quality conformance inspection shall be in accordance with MIL-M-38510 and as specified herein. Inspections to be performed shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.5).

4.4.1 Group A inspection. Group A inspection shall be in accordance with table I of method 5005 of MIL-STD-883 and as follows:

- a. Tests shall be performed in accordance with table II herein.
- b. Subgroups 5, 6, 7, and 8 of table I of method 5005 of MIL-STD-883 shall be omitted.
- c. Subgroup 4 (C_i measurement) shall be measured only for initial qualification and after process or design changes which may affect input capacitance. Capacitance shall be measured between the designated terminal and VSS at a frequency of 1 MHz.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions $\frac{1}{V_{SS}} = 0 \text{ V}$ $-55^\circ\text{C} < T_A \leq +125^\circ\text{C}$ unless otherwise specified	Device type	Limits		Unit
				Min	Max	
Positive clamping input to V_{DD}	$V_{IC(\text{pos})}$	$T_A = 25^\circ\text{C}, V_{DD} = \text{GND},$ $V_{SS} = \text{Open},$ $\text{Output} = \text{Open},$ $I_I = 1 \text{ mA}$	A11	---	1.5	V
Negative clamping input to V_{SS}	$V_{IC(\text{neg})}$	$T_A = 25^\circ\text{C}, V_{DD} = \text{Open},$ $V_{SS} = \text{GND},$ $\text{Output} = \text{Open},$ $I_I = -1 \text{ mA}$	A11	---	-6	V
Quiescent supply current	I_{SS}	Any combinations of inputs	$V_{DD} = 15 \text{ V}$	01, 02, 03	---	-750 nA
			$V_{DD} = 18 \text{ V}$	51, 52, 53		
High level output voltage	V_{OH1}	$V_{DD} = 5 \text{ V}, I_{OH} = -0.175 \text{ mA}$ Any one input = V_{IL} (see table III)	A11	4.2	---	V
	V_{OH2}	$V_{DD} = 5 \text{ V}, I_{OH} = 0$ Any one input = V_{IL} (see table III)	A11	4.95	---	V
	V_{OH3}	$V_{DD} = 12.5 \text{ V}, I_{OH} = 0$ Any one input = V_{IL} (see table III)	A11	11.25	---	V
	V_{OH4}	$V_{DD} = 15 \text{ V}, I_{OH} = 0$	51, 52, 53	14.95	---	V
Low level output voltage	V_{OL1}	$V_{DD} = 5 \text{ V}, I_{OL} = 0.175 \text{ mA}$ $I_{OL} = 0.085 \text{ mA}$ A11 inputs = V_{IH} (see table III)	01 02, 03	---	0.5 0.7	V
	V_{OL2}	$V_{DD} = 5 \text{ V}, I_{OL} = 0$ A11 inputs = V_{IH} (see table III)	A11	0.05	---	V
	V_{OL3}	$V_{DD} = 12.5 \text{ V}, I_{OL} = 0$ A11 inputs = V_{IH} (see table III)	A11	1.25	---	V
	V_{OL4}	$V_{DD} = 15 \text{ V}, I_{OL} = 0$	51, 52, 53		0.05	V

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions $\frac{1}{V_{SS}} = 0 \text{ V}$ $-55^\circ\text{C} \leq T_A \leq +125^\circ\text{C}$ unless otherwise specified	Device type	Limits		Unit
				Min	Max	
Input high voltage	V_{IH1}	$V_{DD} = 5 \text{ V}$ $V_0 = 0.5 \text{ V}$ $ I_0 \leq 1 \mu\text{A}$	51,52, 53	3.5		V
	V_{IH2}	$V_{DD} = 10 \text{ V}$ $V_0 = 1.0 \text{ V}$ $ I_0 \leq 1 \mu\text{A}$		7.0		V
	V_{IH3}	$V_{DD} = 15 \text{ V}$ $V_0 = 1.5 \text{ V}$ $ I_0 \leq 1 \mu\text{A}$		11.0		V
Input low voltage	V_{IL1}	$V_{DD} = 5 \text{ V}$ $V_0 = 4.5 \text{ V}$ $ I_0 \leq 1 \mu\text{A}$	51,52, 53		1.5	V
	V_{IL2}	$V_{DD} = 10 \text{ V}$ $V_0 = 9.0 \text{ V}$ $ I_0 \leq 1 \mu\text{A}$			3.0	V
	V_{IL3}	$V_{DD} = 15 \text{ V}$ $V_0 = 13.5 \text{ V}$ $ I_0 \leq 1 \mu\text{A}$			4.0	V
Output low (sink) current	I_{OL1}	$V_{DD} = 5 \text{ V}$ $V_{IN} = 5 \text{ V}$ $V_{OL} = 0.4 \text{ V}$	51,52, 53	0.36		mA
	I_{OL2}	$V_{DD} = 15 \text{ V}$ $V_{IN} = 15 \text{ V}$ $V_{OL} = 1.5 \text{ V}$		2.4		mA
Output high (source) current	I_{OH1}	$V_{DD} = 5 \text{ V}$ Any one input = V_{SS} All other inputs = V_{DD} $V_{OH} = 4.6 \text{ V}$	51,52, 53	-0.36		mA
	I_{OH2}	$V_{DD} = 15 \text{ V}$ Any one input = V_{SS} All other inputs = V_{DD} $V_{OH} = 13.5 \text{ V}$		-2.4		mA
Input leakage current $\underline{2/}$	I_{IH}	Measure inputs sequentially	$V_{DD} = 15 \text{ V}$	01,02, 03	45	nA
			$V_{DD} = 18 \text{ V}$	51,52, 53		
	I_{IL}	Measure inputs sequentially	$V_{DD} = 15 \text{ V}$	01,02, 03	-45	nA
			$V_{DD} = 18 \text{ V}$	51,52, 53		

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions $\frac{1}{V_{SS}} = 0 \text{ V}$ $-55^\circ\text{C} \leq T_A \leq +125^\circ\text{C}$ unless otherwise specified	Device type	Limits		Unit
				Min	Max	
Input test voltage	V_{ZAP}	$C_1 = 100 \text{ pF}$, $R_Z = 1.5 \text{ k}\Omega$ (see 4.5.3)	A11	400		V
Input capacitance	C_I	$V_{DD} = 0 \text{ V}$, $f = 1 \text{ MHz}$ $T_A = 25^\circ\text{C}$	A11		12	pF
Propagation delay time high to low level	t_{PHL}	$V_{DD} = 5 \text{ V}$, $C_L = 50 \text{ pF}$ (see figure 5)	01 02 03	15 15 15	300 490 265	ns
			51 52 53	10 16 9	300 490 265	
Propagation delay time low to high level	t_{PLH}		01,03 02	15 15	225 375	ns
			51,53 52	8 13	225 375	
Transition time high to low level	t_{THL}		01 02 03	25 40 25	450 825 375	ns
			51 52 53	15 28 13	450 825 375	
Transition time low to high level	t_{TLH}		01 02 03	30 35 30	450 640 450	ns
			51 52 53	15 21 12	450 640 450	

1/ Complete terminal conditions shall be as specified in table III.

2/ Input current at one input node.

TABLE II. Burn-in and electrical test requirements.

Line no.	Applicable tests and MIL-STD-883 test method	Class S device 3/				Class B devices 3/			
		Ref. par.	Table 2/ III sub-groups	Table 1/ IV delta limits	Test circuit figure	Ref. par.	Table 2/ III sub-groups	Table 1/ IV delta limits	Test circuit figure
1	Interim electrical parameters (method 5004)		1				1		
2	Static burn-in I (method 1015)	4.2b 4.5.2				3			
3	Same as line 1		1	Δ					
4	Static burn-in II (method 1015)	4.2b 4.5.2				3 4.2b 4.5.2	4/		3
5	Same as line 1	4.2d	1*	Δ		4.2d	1*	Δ	
6	Dynamic burn-in (method 1015)	4.2b 4.5.2				4			
7	Same as line 1	4.2d	1*	Δ					
8	Final electrical parameters (method 5004)		1*, 2, 3, 9				1*, 2, 3, 9		
9	Group A end-point electrical parameters (method 5005)	4.4.1b	1, 2, 3, 4, 9, 10, 11			4.4.1b	1, 2, 3, 4, 9		
10	Group B end-point electrical parameters (method 5005)	4.4.2	1, 2, 3, 9, 10, 11	Δ					
11	Group C end-point electrical parameters (method 5005)					4.4.3	1, 2, 3	Δ	
12	Additional group C tests, (method 5005)					4.4.3c	10, 11		
13	Group D end-point electrical parameters (method 5005)	4.4.4	1, 2, 3			4.4.4	1, 2, 3		

1/ (Δ) indicates delta limit shall be required on table III subgroup 1, where specified, and delta values shall be computed with reference to the previous interim electrical parameters.

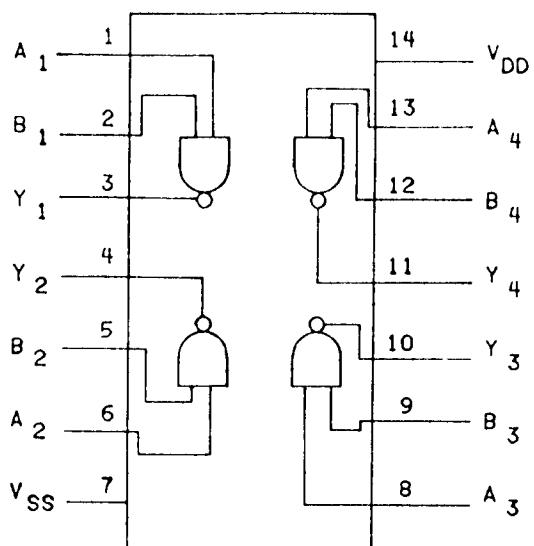
2/ (*) indicates PDA applies to subgroup 1 (see 4.2.1).

3/ Blank spaces indicate tests are not applicable.

4/ The device manufacturer may at his option either perform delta measurements or within 24 hours after burn-in (or removal of bias) perform the final electrical parameter measurements.

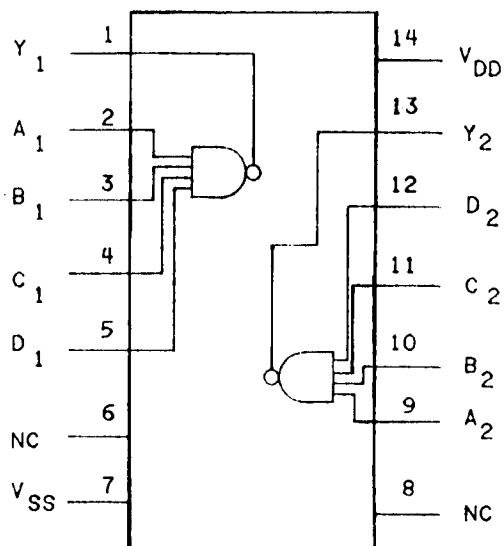
Device type 01 and 51

Cases A, C, D, X and Y



Device types 02 and 52

Cases A, C, D, X and Y



Device types 03 and 53

Cases A, C, D, X and Y

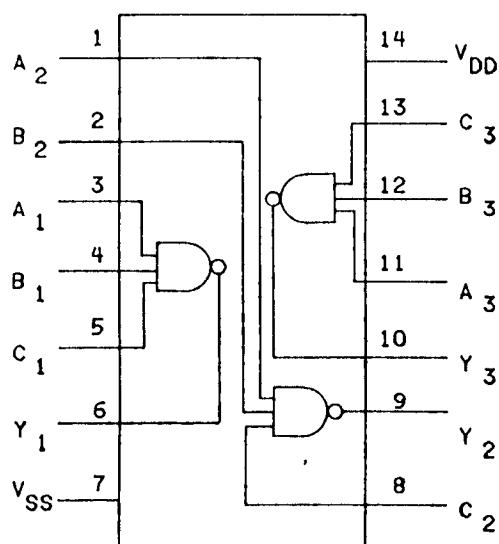


FIGURE 1. Logic diagrams and terminal connections.

Device types 01 and 51

Truth table each gate		
Input		Output
A	B	Y
L	L	H
H	L	H
L	H	H
H	H	L

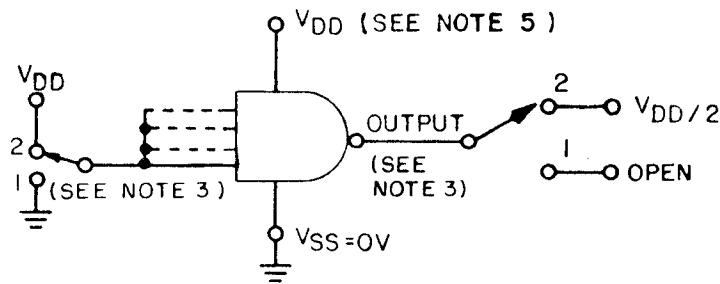
Positive logic $Y = \overline{AB}$ Device types 02 and 52

Truth table each gate				
Input				Output
A	B	C	D	Y
L	L	L	L	H
H	L	L	L	H
L	H	L	L	H
H	H	L	L	H
L	L	H	L	H
H	L	H	L	H
L	H	H	L	H
H	H	H	L	H
L	L	L	H	H
H	L	L	H	H
L	H	L	H	H
H	H	L	H	H
L	L	H	H	H
H	L	H	H	H
L	H	H	H	H
H	H	H	H	L

Positive logic $Y = \overline{ABCD}$ Device types 03 and 53

Truth table each gate			
Input			Output
A	B	C	Y
L	L	L	H
H	L	L	H
L	H	L	H
H	H	L	H
L	L	H	H
H	L	H	H
L	H	H	H
H	H	H	L

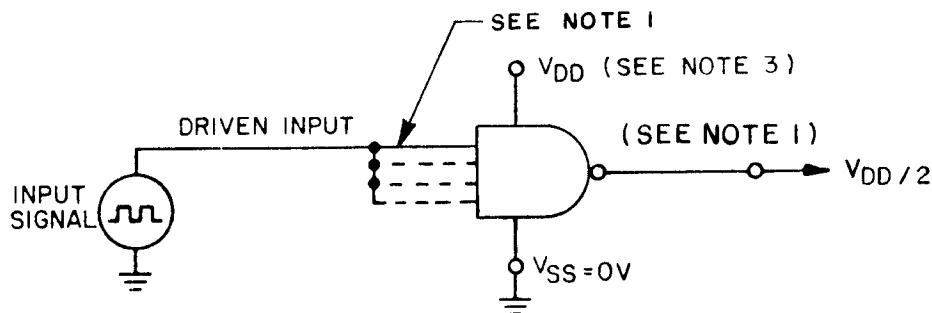
Positive logic $Y = \overline{ABC}$ FIGURE 2. Truth tables and logic equations.



NOTES:

1. For static burn-in I, all inputs are connected to 0 volts, switch position 1.
2. For static burn-in II, all inputs are connected to V_{DD} , switch position 2.
3. Except for V_{DD} and V_{SS} , each terminal shall be connected through a resistor whose value is $2\text{ k}\Omega$ or $47\text{ k}\Omega$. The actual measured value of the resistor selected shall not exceed $\pm 20\%$ of its branded value due to use, heat or age.
4. Output may be in switch position 1 or 2.
5. $V_{DD} = 12.5\text{ V}$ minimum, 15 V maximum for device 01, 02, 03.
 $V_{DD} = 15\text{ V}$ minimum, 18 V maximum for device 51, 52, 53.
 $V_{DD}/2 = V_{DD}/2 \pm 1.0\text{ V}$.
 $V_{SS} = 0\text{ V}$.

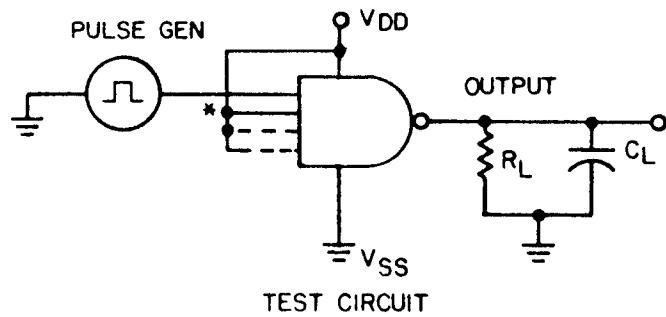
FIGURE 3. Static burn-in test circuits.



NOTES:

1. Except for V_{DD} and V_{SS} , each terminal shall be connected through a resistor whose value is $2\text{ k}\Omega$ or $47\text{ k}\Omega$. The actual measured value of the resistor selected shall not exceed $\pm 20\%$ of its branded value due to use, heat or age.
2. Input signal requirements:
 - a. Square wave, 50% duty cycle.
 - b. $25\text{ kHz} < \text{PRR} < 1\text{ MHz}$.
 - c. t_{TLH} and $t_{THL} < 1\text{ }\mu\text{s}$.
 - d. Voltage level:
Minimum = $V_{SS} - 0.5\text{ V}$, $+10\% V_{DD}$.
Maximum = $V_{DD} + 0.5\text{ V}$, $-10\% V_{DD}$.
3. For device types 01 and 51:
 - a. Connect pins 14, 2, and 11 together.
 - b. Connect pins 7, 4, and 9 together.
 - c. Connect pins 13 and 8 together.
 - d. Connect pins 1 and 5 together.
4. $V_{DD} = 12.5\text{ V}$ minimum, 15.0 V maximum for device 01, 02, 03, and 04.
 $V_{DD} = 15.0\text{ V}$ minimum, 18.0 V maximum for device 51, 52, 53, and 54.
 $V_{DD}/2 = V_{DD}/2 \pm 1.0\text{ V}$.
 $V_{SS} = 0.0\text{ V}$.

FIGURE 4. Dynamic burn-in and operating life test circuit.

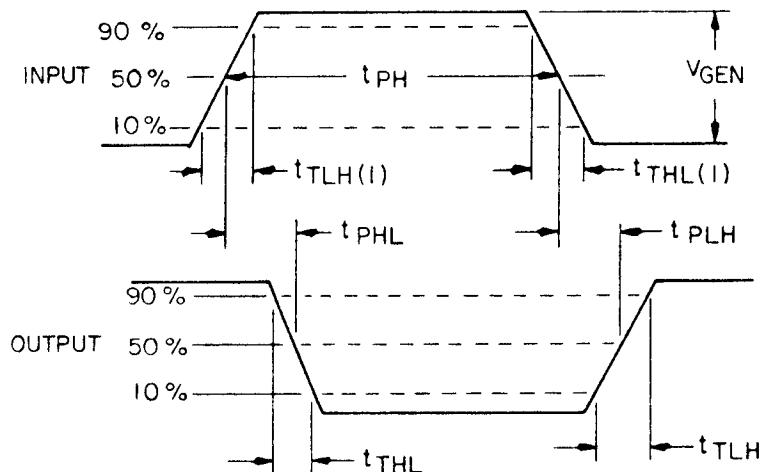


*NOTE: All unused inputs must be tied to VDD

$$R_L = 200 \text{ k}\Omega \pm 10\%$$

$$C_L = 50 \text{ pF} \pm 5$$

(Includes wiring and probe capacitance)



Input pulse

$$V_{GEN} = V_{DD} \pm 1.0\%$$

$$t_{PH} = 1.0 \pm 0.1 \mu\text{s}$$

$$t_{THL(1)} = t_{TLH(1)} = 10 \pm 2 \text{ ns}$$

$$\text{PRR} = 200 \text{ kHz}$$

FIGURE 5. Switching time test circuit and waveforms.

TABLE III. Group A inspection for device type 01.

Symbol	MIL-STD-883 C,D,X,Y method	Cases A, C,D,X,Y	For terminal conditions and limits, see <u>U</u> and <u>J</u>														Test limits			
			Subgroup 1 TA = 25°C							Subgroup 2 TA = 125°C			Subgroup 3 TA = -55°C		Measured terminal					
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
V_{I1}	1	1 mA	1 mA												GND	1A	1.5			
	2	1 mA	1 mA												"	1B				
	3														"	2B				
	4														"	2A				
	5														"	3A				
	6														"	3B				
	7														"	4B				
	8														"	4A				
V_{I2} (pos)	9	-1 mA	-1 mA																	
	10																			
	11																			
	12																			
	13																			
	14																			
	15																			
	16																			
$I_{SS} \underline{U}$	17	15.0 V	15.0 V	GND	15.0 V	GND	15.0 V	GND	15.0 V	GND	15.0 V	GND	15.0 V	GND	15.0 V	15.0 V	15.0 V	-25.0	-750.0	NA
	18																	"	"	"
	19																			
I_{OH1}	20	5.0 V	5.0 V	I_{OH1}	V_{IL1}	V_{IL1}	I_{OH1}	V_{IL1}	V_{IL1}	I_{OH1}	V_{IL1}	V_{IL1}	I_{OH1}	V_{IL1}	I_{OH1}	V_{IL1}	V_{SS}	-25.0	4.2	4.2
	21																			
	22																			
	23																			
	24																			
	25																			
	26																			
	27																			
V_{OH2}	28	5.0 V	5.0 V	V_{IL2}	V_{IL2}	V_{IL2}	I_{OH2}	V_{IL2}	V_{IL2}	I_{OH2}	V_{IL2}	V_{IL2}	I_{OH2}	V_{IL2}	V_{IL2}	V_{IL2}	V_{SS}	4.95	4.95	4.95
	29																			
	30																			
	31																			
	32																			
	33																			
	34																			
	35																			
V_{OH3}	36	12.5 V	12.5 V	V_{IL3}	V_{IL3}	V_{IL3}	I_{OH3}	V_{IL3}	V_{IL3}	I_{OH3}	V_{IL3}	V_{IL3}	I_{OH3}	V_{IL3}	V_{IL3}	V_{IL3}	V_{SS}	11.25	11.25	11.25
	37																			
	38																			
	39																			
	40																			
	41																			
	42																			
	43																			
V_{OL1}	44	V_{IH1}	V_{IH1}	I_{OL1}	V_{GND}	V_{GND}	I_{OL1}	V_{IH1}	V_{IH1}	I_{OL1}	V_{GND}	V_{GND}	I_{OL1}	V_{IH1}	V_{IH1}	V_{IH1}	V_{SS}	0.5	0.5	0.5
	45																			
	46																			
	47																			

See footnotes at end of device type 03.

TABLE III. Group A inspection for device type 01 - Continued.

Symbol	MIL-STD-883 method	For terminal conditions and limits, see 1/ and 3/												Test limits						
		Measured terminal												Subgroup 1 $T_A = 25^\circ C$		Subgroup 2 $T_A = 125^\circ C$		Subgroup 3 $T_A = -55^\circ C$		
		Cases A, C,D,X,Y	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Min	Max	Min	Max
V_{OL2}	3007	48	V_{IH1} GND	V_{IH1} GND	V_{IH1} GND	V_{IH1} GND	GND	5.0 V	1Y	0.05	0.05	0.05	Y							
	"	49	V_{IH1} GND	5.0 V	2Y	"	"	"	"											
	"	50	"	"	"	"	"	"	"	"	"	"	"	"	2Y	"	"	"	"	"
	"	51	"	"	"	"	"	"	"	"	"	"	"	"	3Y	"	"	"	"	"
														4Y	"	"	"	"	"	
V_{OL3}	"	52	V_{IH2} GND	GND	12.5 V	1Y	1.25	1.25	1.25	"										
	"	53	"	"	"	"	"	"	"	"	"	"	"	"	2Y	"	"	"	"	"
	"	54	"	"	"	"	"	"	"	"	"	"	"	"	3Y	"	"	"	"	"
	"	55	"	"	"	"	"	"	"	"	"	"	"	"	4Y	"	"	"	"	"
$I_{TH1\ 2/}$	3010	56	15.0 V	15.0 V			15.0 V	15.0 V	"	15.0 V	15.0 V	"	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	A11	nA
I_{IH2}	"	57	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	"	58	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	"	59	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	"	60	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	"	61	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	"	62	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	"	63	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	"	64	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
$I_{IL1\ 2/}$	3009	65	GND	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	A11											
																			together	
I_{IL2}	"	66	"	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	-8.0											
	"	67	15.0 V	GND	15.0 V	GND	15.0 V	GND	-1.0											
	"	68	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	-45.0
	"	69	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	"	70	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	"	71	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	"	72	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	"	73	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
I_C1	3012	74	F	F															Subgroup 4 $T_A = 25^\circ C$	
	"	75																	PF	
	"	76																		
	"	77																		
	"	78																		
	"	79																		
	"	80																		
	"	81																		
t_{PHL}	3003 Fig. 5	82	IN 5.0 V	OUT 5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	Subgroup 9 $T_A = 125^\circ C$										
	"	83	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	TA = -55^\circ C
	"	84	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	"	85	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	"	86	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	"	87	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	"	88	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	"	89	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	

See footnotes at end of device type 03.

TABLE III. Group A inspection for device type 01 - Continued.

Symbol	MIL-STD-883 method	Cases A, C,D,X,Y test no.	For terminal conditions and limits, see <u>Y</u> and <u>Z</u>												Test limits																							
			1				2				3				4				5		6		7		8		9		10		11		12		13		14	
			1A	1B	1Y	2Y	2B	2A	VS _S	3A	3B	3Y	4Y	4B	4A	V _{DD}	Measured terminal	Subgroup 9 TA = 25°C	Subgroup 10 TA = 125°C	Subgroup 11 TA = -55°C	Unit	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max					
t _{PLH}	3003 Fig. 5	90 91 92 93 94 95 96 97	IN 5.0 V	5.0 V	OUT OUT	OUT OUT	5.0 V 5.0 V	5.0 V 5.0 V	GND	5.0 V 5.0 V	1A to 1Y 1B to 1Y 2B to 2Y 2A to 2Y 3A to 3Y 3B to 3Y 4B to 4Y 4A to 4Y	20 18 to 1Y 26 to 2Y 12A to 2Y 3A to 3Y 3B to 3Y 4B to 4Y 4A to 4Y	20 18 to 1Y 26 to 2Y 12A to 2Y 3A to 3Y 3B to 3Y 4B to 4Y 4A to 4Y	20 18 to 1Y 26 to 2Y 12A to 2Y 3A to 3Y 3B to 3Y 4B to 4Y 4A to 4Y	20 18 to 1Y 26 to 2Y 12A to 2Y 3A to 3Y 3B to 3Y 4B to 4Y 4A to 4Y	ns	150	30	225	15	150	ns																
t _{THL}	3004 Fig. 5	98 99 100 101 102 103 104 105	IN 5.0 V	5.0 V	OUT OUT	OUT OUT	IN 5.0 V	IN 5.0 V	IN	IN 5.0 V	5.0 V 5.0 V	5.0 V 5.0 V	5.0 V 5.0 V	5.0 V 5.0 V	5.0 V 5.0 V	5.0 V 5.0 V	5.0 V 5.0 V	5.0 V 5.0 V	5.0 V 5.0 V	5.0 V 5.0 V	5.0 V 5.0 V	30 1Y 2Y 3Y 4Y 4Y	300	45	450	25	300	ns										
t _{TLH}		106 107 108 109 110 111 112 113	IN 5.0 V	5.0 V	OUT OUT	OUT OUT	IN 5.0 V	IN 5.0 V	IN	IN 5.0 V	5.0 V 5.0 V	5.0 V 5.0 V	5.0 V 5.0 V	5.0 V 5.0 V	5.0 V 5.0 V	5.0 V 5.0 V	5.0 V 5.0 V	5.0 V 5.0 V	5.0 V 5.0 V	5.0 V 5.0 V	5.0 V 5.0 V	40 1Y 2Y 3Y 4Y 4Y	60	ns	30	ns	ns	ns										

See footnotes at end of device type 03.

TABLE III. Group A inspection for device type 02.

Symbol	MIL-STD-883 method	Cases A, C,D,X,Y	For terminal conditions and limits, see <u>1/</u> and <u>3/</u>												Test limits						
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Subgroup 1 TA = 25 C	Subgroup 2 TA = 125 C	Subgroup 3 TA = -65 C	Unit
V _{IC} (pos) <u>1/</u>	1	1 mA	1A	1B	1C	1D	NC	V _{SS}	NC	2A	2B	2C	2D	2Y	V _{DD}	GND	1A	1B	1C	V	
	2	1 mA	1 mA	1 mA	1 mA	1 mA				1 mA	1 mA	1 mA	1 mA	1 mA			"	"	"	"	
	3																				
	4																				
	5																				
	6																				
	7																				
	8																				
V _{IC} (neg) <u>1/</u>	9	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	V _{DD}	GND	1A	1B	1C	V	
	10																"	"	"	"	
	11																				
	12																				
	13																				
	14																				
	15																				
	16																				
I _{SS} <u>1/</u>	17	GND	15.0 V	15.0 V	15.0 V	15.0 V	GND	"	"	GND	15.0 V	15.0 V	GND	"	15.0 V	V _{SS}	1A	1B	1C	mA	
	18	15.0 V	"	15.0 V	"	15.0 V	GND	"	"	"	15.0 V	15.0 V	GND	"	15.0 V	"	"	"	"	"	
	19	"	"	"	"	"	GND	"	"	"	"	"	GND	"	"	"	"	"	"	"	
	20	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	21	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
V _{OH1}	22	I _{OH1}	V _{L1}	V _{L1}	V _{L1}	V _{L1}	V _{L1}	V _{L1}	V _{L1}	V _{L1}	V _{L1}	V _{L1}	V _{L1}	V _{L1}	GND	GND	5.0 V	1Y	4.2	V	
	23	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	GND	"	"	"	"
	24	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"
	25	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"
	26	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"
	27	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"
	28	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"
	29	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"
V _{OH2}	30	V _{L1}	5.0 V	5.0 V	5.0 V	5.0 V	V _{L1}	V _{L1}	GND	GND	5.0 V	1Y	4.2	4.2							
	31	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"
	32	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"
	33	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"
	34	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"
	35	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"
	36	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"
	37	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"
V _{OH3}	38	V _{L1}	12.5 V	12.5 V	12.5 V	12.5 V	V _{L1}	V _{L1}	GND	GND	12.5 V	1Y	11.25	"							
	39	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"
	40	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"
	41	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"
	42	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"
	43	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"
	44	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"
	45	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"
V _{OL1}	3007	I _{OL2}	V _{H1L}	GND	V _{H1L}	GND	V _{H1L}	GND	V _{H1L}	GND	V _{H1L}	GND	V _{H1L}	GND	GND	GND	5.0 V	1Y	0.7	0.7	
	46	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"
	47	"	"	"	"	"	"	"	"	"	"	"	"	"	"		"	"	"	"	"

See footnotes at end of device type 03.

TABLE III. Group A inspection for device type 02 -Continued.

Symbol	MIL-STD-883 method	Cases A, C,D,X,Y	For terminal conditions and limits, see <u>U</u> and <u>J</u>												Test limits					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Subgroup 1 $T_A = 25^\circ C$	Subgroup 2 $T_A = 125^\circ C$	Subgroup 3 $T_A = -55^\circ C$
Y0L2	3007	48	I_A	I_B	I_C	I_D	NC	V_{SS}	NC	I_A	I_B	I_C	I_D	2γ	V_{DD}	5.0 V	$\frac{1}{2}Y$	0.05	0.05	$\frac{1}{2}Y$
Y0L3	"	50	V_{IH1}	GND	V_{IH2}	GND				GND	V_{IH1}	GND	V_{IH1}							
Y0L3	"	51	V_{IH2}	GND	V_{IH1}	GND				GND	V_{IH2}	GND	V_{IH2}							
IIH1 2/	3010	52	15.0 V	15.0 V	15.0 V	15.0 V				15.0 V	15.0 V	15.0 V	15.0 V		15.0 V	15.0 V	A11 together	8.0		mA
IIH2	"	53																1A	1.0	45.0
IIH2	"	54																1B		
IIH2	"	55																1C		
IIH2	"	56																1D		
IIH2	"	57																2A		
IIH2	"	58																2B		
IIH2	"	59																2C		
IIH2	"	60																2D		
III1 2/	3009	61																A11 together	-8.0	
II1L2	"	62																	-45.0	
II1L2	"	63																1A	-1.0	
II1L2	"	64																1B		
II1L2	"	65																1C		
II1L2	"	66																1D		
II1L2	"	67																2A		
II1L2	"	68																2B		
II1L2	"	69																2C		
II1L2	"																	2D		
C1	3012	70			F															
C1	"	71																		
C1	"	72																		
C1	"	73																		
C1	"	74																		
C1	"	75																		
C1	"	76																		
C1	"	77																		
IpHL	3003 F19.5	78	OUT	V_{IN}	5.0 V	5.0 V				GND	5.0 V	5.0 V	5.0 V		5.0 V	$\frac{1}{2}Y$	20	325	30	490
IpHL	"	79		V_{IN}	5.0 V	5.0 V					"	"	"		"	$\frac{1}{2}Y$	1A	12.0		
IpHL	"	80		"	"	"					"	"	"		"	$\frac{1}{2}Y$	1B			
IpHL	"	81		"	"	"					"	"	"		"	$\frac{1}{2}Y$	1C			
IpHL	"	82		"	"	"					"	"	"		"	$\frac{1}{2}Y$	1D			
IpHL	"	83		"	"	"					"	"	"		"	$\frac{1}{2}Y$	2A			
IpHL	"	84		"	"	"					"	"	"		"	$\frac{1}{2}Y$	2B			
IpHL	"	85		"	"	"					"	"	"		"	$\frac{1}{2}Y$	2C			
IpHL	"																2D			
Subgroup 4 $T_A = 25^\circ C$																				
Subgroup 9 $T_A = 25^\circ C$																				
Subgroup 10 $T_A = 125^\circ C$																				
Subgroup 11 $T_A = 125^\circ C$																				
Subgroup 11 $T_A = -55^\circ C$																				

See footnotes at end of device type 03.

TABLE III. Group A inspection for device type 02 -Continued.

Symbol	MIL-STD-883 method	Cases A, C,D,X,Y	For terminal conditions and limits, see 1/ and 3/												Test limits					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Subgroup 9 $T_A = 25^\circ C$	Subgroup 10 $T_A = 125^\circ C$	Subgroup 11 $T_A = -55^\circ C$
		test no.	1Y	1A	1B	1C	1D	NC	VSS	NC	2A	2B	2C	2D	2Y	V _{DD}				
tPLH	F19, 5	86	OUT	IN	5.0 V	5.0 V	5.0 V	GND		5.0 V	5.0 V	1Y	1Y	1Y						
		87	"	"	5.0 V	"	5.0 V			"	"	"	"	"	"	"	2Y	2Y	2Y	
		88	"	"	"	"	5.0 V	IN	5.0 V							OUT	"	"	"	
		89	"	"	"	"	"	5.0 V	5.0 V								"	"	"	
		90	"	"	"	"	"	"	"								"	"	"	
		91	"	"	"	"	"	"	"								"	"	"	
		92	"	"	"	"	"	"	"								"	"	"	
		93	"	"	"	"	"	"	"								"	"	"	
tTTLH	F19, 5	94	OUT	IN	5.0 V	5.0 V	5.0 V										5.0 V	5.0 V	5.0 V	
		95	"	"	"	"	"										"	"	"	
		96	"	"	"	"	"										"	"	"	
		97	"	"	"	"	"										"	"	"	
		98	"	"	"	"	"										"	"	"	
		99	"	"	"	"	"										"	"	"	
		100	"	"	"	"	"										"	"	"	
		101	"	"	"	"	"										"	"	"	
tTTLH		102	OUT	IN	5.0 V	5.0 V	5.0 V										5.0 V	5.0 V	5.0 V	
		103	"	"	"	"	"										"	"	"	
		104	"	"	"	"	"										"	"	"	
		105	"	"	"	"	"										"	"	"	
		106	"	"	"	"	"										"	"	"	
		107	"	"	"	"	"										"	"	"	
		108	"	"	"	"	"										"	"	"	
		109	"	"	"	"	"										"	"	"	

See footnotes at end of device type 03.

TABLE III. Group A inspection for device type 03.

Symbol	MTI- STD-883 method	Cases A, C,D,X,Y	For terminal conditions and limits, see \underline{V}_1 and \underline{V}_2 .												Test limits							
			Subgroup 1						Subgroup 2			Subgroup 3			Unit							
			Measured terminal	$T_A = 25^\circ C$	$T_A = 125^\circ C$	$T_A = -55^\circ C$	$T_A = 25^\circ C$	$T_A = 125^\circ C$	$T_A = -55^\circ C$	$T_A = 25^\circ C$	$T_A = 125^\circ C$	$T_A = -55^\circ C$	$T_A = 25^\circ C$	$T_A = 125^\circ C$	$T_A = -55^\circ C$	Min	Max	Min	Max	Min	Max	
V_{D1}	1	1 mA	2A	2B	1A	1B	1C	1Y	V_{SS}	2C	2Y	3Y	3A	3B	3C	V_{DD}	2A	2B	1A	1B	1C	1
V_{D2} (pos)	2	1 mA	2A	2B	1A	1B	1C	1Y								GND						
V_{D2}	3	1 mA																				
V_{D3} (pos)	4	1 mA																				
V_{D3}	5	1 mA																				
V_{D4}	6	1 mA																				
V_{D5}	7	1 mA																				
V_{D6}	8	1 mA																				
V_{D7}	9	1 mA																				
$V_{IC}(neg)$	10	-1 mA																				
V_{IC}	11	-1 mA																				
V_{IC}	12	-1 mA																				
V_{IC}	13	-1 mA																				
V_{IC}	14	-1 mA																				
V_{IC}	15	-1 mA																				
V_{IC}	16	-1 mA																				
V_{IC}	17	-1 mA																				
V_{IC}	18	-1 mA																				
$I_{SS} \underline{V}_1$	19	GND	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V								GND	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V
$I_{SS} \underline{V}_1$	20	GND	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V								GND	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V
$I_{SS} \underline{V}_1$	21	GND	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V								GND	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V
$I_{SS} \underline{V}_1$	22	GND	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V								GND	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V
V_{OH1}	23	V_{LL1}	5.0 V	5.0 V	GND	GND	GND	GND								5.0 V	I_{OH1}	"	GND	GND	5.0 V	2Y
V_{OH1}	24	V_{LL1}	5.0 V	5.0 V	GND	GND	V_{LL1}	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	V_{LL1}	GND	"	GND	GND	5.0 V	2Y	4.2
V_{OH1}	25	V_{LL1}	5.0 V	5.0 V	GND	GND	V_{LL1}	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	V_{LL1}	GND	"	GND	GND	5.0 V	2Y	4.2
V_{OH1}	26	V_{LL1}	5.0 V	5.0 V	GND	GND	V_{LL1}	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	V_{LL1}	GND	"	GND	GND	5.0 V	2Y	4.2
V_{OH1}	27	V_{LL1}	5.0 V	5.0 V	GND	GND	V_{LL1}	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	V_{LL1}	GND	"	GND	GND	5.0 V	2Y	4.2
V_{OH1}	28	V_{LL1}	5.0 V	5.0 V	GND	GND	V_{LL1}	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	V_{LL1}	GND	"	GND	GND	5.0 V	2Y	4.2
V_{OH1}	29	V_{LL1}	5.0 V	5.0 V	GND	GND	V_{LL1}	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	V_{LL1}	GND	"	GND	GND	5.0 V	2Y	4.2
V_{OH1}	30	V_{LL1}	5.0 V	5.0 V	GND	GND	V_{LL1}	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	V_{LL1}	GND	"	GND	GND	5.0 V	2Y	4.2
V_{OH1}	31	V_{LL1}	5.0 V	5.0 V	GND	GND	V_{LL1}	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	V_{LL1}	GND	"	GND	GND	5.0 V	2Y	4.2
V_{OH2}	32	V_{LL2}	5.0 V	5.0 V	GND	GND	V_{LL2}	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	V_{LL2}	GND	"	GND	GND	5.0 V	2Y	4.95
V_{OH2}	33	V_{LL2}	5.0 V	5.0 V	GND	GND	V_{LL2}	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	V_{LL2}	GND	"	GND	GND	5.0 V	2Y	4.95
V_{OH2}	34	V_{LL2}	5.0 V	5.0 V	GND	GND	V_{LL2}	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	V_{LL2}	GND	"	GND	GND	5.0 V	2Y	4.95
V_{OH2}	35	V_{LL2}	5.0 V	5.0 V	GND	GND	V_{LL2}	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	V_{LL2}	GND	"	GND	GND	5.0 V	2Y	4.95
V_{OH2}	36	V_{LL2}	5.0 V	5.0 V	GND	GND	V_{LL2}	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	V_{LL2}	GND	"	GND	GND	5.0 V	2Y	4.95
V_{OH2}	37	V_{LL2}	5.0 V	5.0 V	GND	GND	V_{LL2}	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	V_{LL2}	GND	"	GND	GND	5.0 V	2Y	4.95
V_{OH2}	38	V_{LL2}	5.0 V	5.0 V	GND	GND	V_{LL2}	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	V_{LL2}	GND	"	GND	GND	5.0 V	2Y	4.95
V_{OH2}	39	V_{LL2}	5.0 V	5.0 V	GND	GND	V_{LL2}	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	V_{LL2}	GND	"	GND	GND	5.0 V	2Y	4.95
V_{OH2}	40	V_{LL2}	5.0 V	5.0 V	GND	GND	V_{LL2}	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	V_{LL2}	GND	"	GND	GND	5.0 V	2Y	4.95
V_{OH3}	41	V_{LL3}	12.5 V	12.5 V	GND	GND	V_{LL3}	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	V_{LL3}	GND	"	GND	GND	12.5 V	2Y	11.25
V_{OH3}	42	V_{LL3}	12.5 V	12.5 V	GND	GND	V_{LL3}	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	V_{LL3}	GND	"	GND	GND	12.5 V	2Y	11.25
V_{OH3}	43	V_{LL3}	12.5 V	12.5 V	GND	GND	V_{LL3}	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	V_{LL3}	GND	"	GND	GND	12.5 V	2Y	11.25
V_{OH3}	44	V_{LL3}	12.5 V	12.5 V	GND	GND	V_{LL3}	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	V_{LL3}	GND	"	GND	GND	12.5 V	2Y	11.25
V_{OH3}	45	V_{LL3}	12.5 V	12.5 V	GND	GND	V_{LL3}	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	V_{LL3}	GND	"	GND	GND	12.5 V	2Y	11.25
V_{OH3}	46	V_{LL3}	12.5 V	12.5 V	GND	GND	V_{LL3}	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	V_{LL3}	GND	"	GND	GND	12.5 V	2Y	11.25
V_{OH3}	47	V_{LL3}	12.5 V	12.5 V	GND	GND	V_{LL3}	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	V_{LL3}	GND	"	GND	GND	12.5 V	2Y	11.25
V_{OH3}	48	V_{LL3}	12.5 V	12.5 V	GND	GND	V_{LL3}	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	V_{LL3}	GND	"	GND	GND	12.5 V	2Y	11.25
V_{OH3}	49	V_{LL3}	12.5 V	12.5 V	GND	GND	V_{LL3}	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	12.5 V	V_{LL3}	GND	"	GND	GND	12.5 V	2Y	11.25

See footnotes at end of device type 03.

TABLE III. Group A inspection for device type 03 - Continued.

Symbol	MIL-STD-883 method	Cases A, C, D, X, Y	For terminal conditions and limits; see <u>Y</u> and <u>Z</u>												Test Limits			
			Subgroup 1				Subgroup 2				Subgroup 3				Unit	Measured terminal	Subgroup 3	
			T _A = 25°C		T _A = 125°C		T _A = 125°C		T _A = -55°C		T _A = 125°C		T _A = -55°C					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14		
	Test no.		2A	2B	1A	1B	1C	1Y	V _{SS}	2C	2Y	3Y	3A	3B	3C	V _{DD}		
V _{OL1}	3007	50	V _{TH1} GND	V _{TH1} GND	GND	GND	V _{TH1} GND	V _{TH1} GND	I _{OL1}	V _{TH1} GND	GND	GND	GND	GND	5.0 V	2Y 1Y 3Y	0.7 0.7 0.7	
	"	51	V _{TH1} GND	V _{TH1} GND	V _{TH1} GND	V _{TH1} GND	V _{TH1} GND	V _{TH1} GND	I _{OL1}	V _{TH1} GND	GND	GND	GND	GND	5.0 V	2Y 1Y 3Y	0.7 0.7 0.7	
V _{OL2}	"	53	V _{TH1} GND	V _{TH1} GND	V _{TH1} GND	V _{TH1} GND	V _{TH1} GND	V _{TH1} GND	V _{TH1} GND	V _{TH1} GND	GND	GND	GND	GND	5.0 V	2Y 1Y 3Y	0.7 0.7 0.7	
	"	54	V _{TH1} GND	V _{TH1} GND	V _{TH1} GND	V _{TH1} GND	V _{TH1} GND	V _{TH1} GND	V _{TH1} GND	V _{TH1} GND	GND	GND	GND	GND	5.0 V	2Y 1Y 3Y	0.7 0.7 0.7	
V _{OL3}	"	55	V _{TH2} GND	V _{TH2} GND	V _{TH2} GND	V _{TH2} GND	V _{TH2} GND	V _{TH2} GND	V _{TH2}	V _{TH2} GND	GND	GND	GND	GND	12.5 V	2Y 1Y 3Y	1.25 1.25 1.25	
	"	56	V _{TH2} GND	V _{TH2} GND	V _{TH2} GND	V _{TH2} GND	V _{TH2} GND	V _{TH2} GND	V _{TH2}	V _{TH2} GND	GND	GND	GND	GND	12.5 V	2Y 1Y 3Y	1.25 1.25 1.25	
I _{IL1 2/}	3010	59	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	"	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	All together	9.0	nA
I _{IL2}	"	60	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2A 2B 2C	1.0 1.0 1.0
	"	61	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2A 2B 2C	1.0 1.0 1.0
	"	62	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2A 2B 2C	1.0 1.0 1.0
	"	63	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2A 2B 2C	1.0 1.0 1.0
	"	64	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2A 2B 2C	1.0 1.0 1.0
	"	65	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2A 2B 2C	1.0 1.0 1.0
	"	66	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2A 2B 2C	1.0 1.0 1.0
	"	67	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2A 2B 2C	1.0 1.0 1.0
	"	68	"	"	"	"	"	"	"	"	"	"	"	"	"	"	2A 2B 2C	1.0 1.0 1.0
I _{IL1 2/}	"	69	GND	GND	GND	GND	GND	GND	"	GND	GND	GND	GND	GND	"	All together	-9.0	"
I _{IL2}	"	70	"	15.0 V	"	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	15.0 V	All together	-9.0	"				
	"	71	15.0 V	GND	"	"	"	"	"	GND	"	"	"	"	"	15.0 V	15.0 V	-45.0
	"	72	15.0 V	GND	"	"	"	"	"	GND	"	"	"	"	"	15.0 V	15.0 V	-45.0
	"	73	15.0 V	GND	"	"	"	"	"	GND	"	"	"	"	"	15.0 V	15.0 V	-45.0
	"	74	15.0 V	GND	"	"	"	"	"	GND	"	"	"	"	"	15.0 V	15.0 V	-45.0
	"	75	15.0 V	GND	"	"	"	"	"	GND	"	"	"	"	"	15.0 V	15.0 V	-45.0
	"	76	15.0 V	GND	"	"	"	"	"	GND	"	"	"	"	"	15.0 V	15.0 V	-45.0
	"	77	15.0 V	GND	"	"	"	"	"	GND	"	"	"	"	"	15.0 V	15.0 V	-45.0
	"	78	15.0 V	GND	"	"	"	"	"	GND	"	"	"	"	"	15.0 V	15.0 V	-45.0
C ₁	3012	79	F	F						GND						GND	2A 2B 2C	12.0
	"	80	F	F						F						F	1A 1B 1C	12.0
	"	81	F	F						F						F	3A 3B 3C	12.0
	"	82	F	F						F						F	1A 1B 1C	12.0
	"	83	F	F						F						F	3A 3B 3C	12.0
	"	84	F	F						F						F	1A 1B 1C	12.0
	"	85	F	F						F						F	3A 3B 3C	12.0
	"	86	F	F						F						F	1A 1B 1C	12.0
	"	87	F	F						F						F	3A 3B 3C	12.0

See footnotes at end of device type 03.

TABLE III. Group A inspection for device type 03 - Continued.

Symbol	MIL-STD-883 method	Cases A, C,D,X,Y	For terminal conditions and limits, see 1/ and 3/												Test limits									
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Subgroup 9 TA = 25°C	Subgroup 10 TA = 125°C	Subgroup 11 TA = -55°C	Unit			
Test no.			2A	2B	1A	1B	1C	1Y	VSS	2C	2Y	3Y	3A	3B	3C	V _{DD}	Mn	Max	Mn	Max				
t _{PHL} Fig. 5	3003	88	IN 5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	GND	5.0 V	OUT	"	5.0 V	5.0 V	5.0 V	2Y	20	175	30	265	15	175 ns		
	89	5.0 V	"	5.0 V	"	5.0 V	"	"	OUT	"	"	"	"	"	"	"	2Y	"	"	"	"	"	"	
	90	"	5.0 V	"	5.0 V	"	5.0 V	"	IN	"	5.0 V	"	"	"	"	"	1Y	"	"	"	"	"	"	
	91	"	"	5.0 V	IN	"	"	"	"	"	"	"	"	"	"	"	1Y	"	"	"	"	"	"	
	92	"	"	"	5.0 V	IN	"	"	"	"	"	"	"	"	"	"	1Y	"	"	"	"	"	"	
	93	"	"	"	"	5.0 V	IN	"	"	"	"	"	"	"	"	"	3Y	"	"	"	"	"	"	
t _{PLH}	94	"	"	"	"	"	5.0 V	5.0 V	"	"	"	"	"	"	"	"	3Y	"	"	"	"	"	"	
	95	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	5.0 V	IN	"	"	"	"	"	
	96	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	5.0 V	IN	"	"	"	"	"	
	97	IN 5.0 V	"	5.0 V	IN 5.0 V	"	"	"	"	OUT	"	"	"	"	"	"	5.0 V	"	"	"	"	150	"	
	98	"	99	"	100	"	101	"	102	"	103	"	104	"	105	"	IN 5.0 V	"	"	"	"	"	"	
	99	"	100	"	101	"	102	"	103	"	104	"	105	"	106	"	OUT	"	"	"	"	"	"	
t _{THL} Fig. 5	106	IN 5.0 V	IN 5.0 V	"	"	"	"	"	"	OUT	"	"	"	"	"	"	5.0 V	"	"	"	"	250	"	
	107	"	108	"	109	"	110	"	111	"	112	"	113	"	114	"	IN 5.0 V	"	"	"	"	"	"	
	108	"	"	109	"	110	"	111	"	112	"	113	"	114	"	OUT	"	"	"	"	"	"	"	
	109	"	"	110	"	111	"	112	"	113	"	114	"	"	"	5.0 V	"	"	"	"	"	"	"	
	110	"	"	111	"	112	"	113	"	114	"	"	"	"	"	OUT	"	"	"	"	"	"	"	
	111	"	"	112	"	113	"	114	"	"	"	"	"	"	"	5.0 V	"	"	"	"	"	"	"	
t _{TLH}	115	IN 5.0 V	IN 5.0 V	"	"	"	"	"	"	OUT	"	"	"	"	"	"	5.0 V	"	"	"	"	300	"	
	116	"	117	"	118	"	119	"	120	"	121	"	122	"	123	"	IN 5.0 V	"	"	"	"	"	"	"
	117	"	"	118	"	119	"	120	"	121	"	122	"	123	"	OUT	"	"	"	"	"	"	"	
	118	"	"	119	"	120	"	121	"	122	"	123	"	"	"	5.0 V	"	"	"	"	"	"	"	
	119	"	"	120	"	121	"	122	"	123	"	"	"	"	"	OUT	"	"	"	"	"	"	"	
	120	"	"	121	"	122	"	123	"	"	"	"	"	"	"	5.0 V	"	"	"	"	"	"	"	

1/ Pins not designated may be "High" level logic, "Low" level logic, or open. Exceptions are as follows:

- a. V_{IHC}(pos) tests, the V_{CS} terminal shall be open.
- b. V_{IHC}(neg) tests, the V_{ID} terminal shall be open.
- c. ISS tests, the output terminal shall be open.

2/ The device manufacturer may at his option measure I_{IL} and I_{LH} at 25°C for each individual input or measure all inputs together.

3/

Symbol	V _{IH1}	V _{IL1}	V _{IH2}	V _{IL2}	I _{OL1}	I _{OL2}	F
Temperature							
T _A = 25°C	3.95 V	0.9 V	10.25 V	2.25 V	-0.25 mA	0.25 mA	0.12 mA See 4.4.1.c
T _A = 125°C	3.85 V	0.65 V	10.00 V	1.95 V	-0.175 mA	0.175 mA	0.085 mA
T _A = -55°C	4.05 V	0.95 V	10.50 V	2.40 V	-0.31 mA	0.31 mA	0.15 mA

TABLE III. Group A inspection for device type 51.

Symbol	MIL-STD-883 method	Ca, ss, A, C, D, X, Y test no.	Test limits											
			For terminal conditions and limits, see <u>1/</u> and <u>3/</u>				Measured terminal		Subgroup 1 TA = 25°C		Subgroup 2 TA = 125°C		Subgroup 3 TA = -55°C	
1/	2	3	4	5	6	7	8	9	10	11	12	13	14	
$V_{IC}(pos)$	1	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	
	2	"	"	"	"	"	"	"	"	"	"	"	"	
	3	"	"	"	"	"	"	"	"	"	"	"	"	
	4	"	"	"	"	"	"	"	"	"	"	"	"	
	5	"	"	"	"	"	"	"	"	"	"	"	"	
	6	"	"	"	"	"	"	"	"	"	"	"	"	
	7	"	"	"	"	"	"	"	"	"	"	"	"	
	8	"	"	"	"	"	"	"	"	"	"	"	"	
$V_{IC}(neg)$	9	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	
	10	"	"	"	"	"	"	"	"	"	"	"	"	
	11	"	"	"	"	"	"	"	"	"	"	"	"	
	12	"	"	"	"	"	"	"	"	"	"	"	"	
	13	"	"	"	"	"	"	"	"	"	"	"	"	
	14	"	"	"	"	"	"	"	"	"	"	"	"	
	15	"	"	"	"	"	"	"	"	"	"	"	"	
	16	"	"	"	"	"	"	"	"	"	"	"	"	
V_{SS}	17	18.0 V	18.0 V	18.0 V	18.0 V	18.0 V	18.0 V	18.0 V	18.0 V	18.0 V	18.0 V	18.0 V	18.0 V	
	18	"	"	"	"	"	"	"	"	"	"	"	"	
	19	"	"	"	"	"	"	"	"	"	"	"	"	
V_{OH4}	20	GND	15 V	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	
	21	15 V	GND	"	"	"	"	"	"	"	"	"	"	
	22	"	"	"	"	"	"	"	"	"	"	"	"	
	23	"	"	"	"	"	"	"	"	"	"	"	"	
	24	"	"	"	"	"	"	"	"	"	"	"	"	
	25	"	"	"	"	"	"	"	"	"	"	"	"	
	26	"	"	"	"	"	"	"	"	"	"	"	"	
	27	"	"	"	"	"	"	"	"	"	"	"	"	
V_{OL4}	28	15 V	15 V	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	
	29	"	"	"	"	"	"	"	"	"	"	"	"	
	30	"	"	"	"	"	"	"	"	"	"	"	"	
	31	"	"	"	"	"	"	"	"	"	"	"	"	
V_{IH1}	32	3.5 V	3.5 V	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	
	33	"	"	"	"	"	"	"	"	"	"	"	"	
	34	"	"	"	"	"	"	"	"	"	"	"	"	
	35	"	"	"	"	"	"	"	"	"	"	"	"	
V_{IH2}	36	7.0 V	7.0 V	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	
	37	"	"	"	"	"	"	"	"	"	"	"	"	
	38	"	"	"	"	"	"	"	"	"	"	"	"	
	39	"	"	"	"	"	"	"	"	"	"	"	"	
V_{IH3}	40	11 V	11 V	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	
	41	"	"	"	"	"	"	"	"	"	"	"	"	
	42	"	"	"	"	"	"	"	"	"	"	"	"	
	43	"	"	"	"	"	"	"	"	"	"	"	"	

See footnotes at end of device type 53.

TABLE III. Group A inspection for device type 51 - Continued.

Symbol	MIL-STD-883 method	Cases A, C,D,X,Y	For terminal conditions and limits, see <u>U</u> and <u>J</u>												Test limits							
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Subgroup 1 TA = 25°C	Subgroup 2 TA = 125°C	Subgroup 3 TA = -55°C	Unit	
V _{T11}	44	1.5 V	1.5 V	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	5 V	1 V	1 V	4.5 "	4.5 "	V	
	45	3.5 V	3.5 V	GND	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	46	1.5 V	3.5 V	GND	1.5 V	1.5 V	GND	1.5 V	1 V	1 V	4.5 "	4.5 "	V									
	47	"	"	"	3.5 V	3.5 V	GND	5.0 V	2 V	2 V	4.5 "	4.5 "	V									
	48	"	"	"	1.5 V	3.5 V	GND	1.5 V	3 V	3 V	4.5 "	4.5 "	V									
	49	"	"	"	1.5 V	3.5 V	GND	3.5 V	4 V	4 V	4.5 "	4.5 "	V									
	50	"	"	"	1.5 V	3.5 V	GND	1.5 V	3.5 V	3.5 V	4.5 "	4.5 "	V									
	51	"	"	"	1.5 V	3.5 V	GND	1.5 V	3 V	3 V	4.5 "	4.5 "	V									
	52	"	"	"	1.5 V	3.5 V	GND	1.5 V	3 V	3 V	4.5 "	4.5 "	V									
	53	"	"	"	1.5 V	3.5 V	GND	1.5 V	3 V	3 V	4.5 "	4.5 "	V									
	54	"	"	"	1.5 V	3.5 V	GND	1.5 V	3 V	3 V	4.5 "	4.5 "	V									
	55	"	"	"	1.5 V	3.5 V	GND	1.5 V	3 V	3 V	4.5 "	4.5 "	V									
V _{T12}	56	3.0 V	3.0 V	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	10 V	1 V	1 V	9.0	9.0	V	
	57	7.0 V	7.0 V	GND	3.0 V	3.0 V	GND	10 V	1 V	1 V	9.0	9.0	V									
	58	3.0 V	7.0 V	GND	7.0 V	7.0 V	GND	3.0 V	2 V	2 V	9.0	9.0	V									
	59	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	60	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	61	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	62	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	63	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	64	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	65	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	66	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	67	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
V _{T13}	68	4.0 V	4.0 V	GND	4.0 V	4.0 V	GND	15 V	1 V	1 V	13.5	13.5	V									
	69	11 V	11 V	GND	11 V	11 V	GND	4.0 V	2 V	2 V	13.5	13.5	V									
	70	4.0 V	11 V	GND	4.0 V	11 V	GND	11 V	3 V	3 V	13.5	13.5	V									
	71	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	72	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	73	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	74	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	75	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	76	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	77	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	78	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	79	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
I _{T11}	80	5 V	5 V	GND	0.4 V	0.4 V	GND	5 V	0.4 V	0.4 V	0.51	0.36	mA									
	81	15 V	15 V	GND	1.5 V	1.5 V	GND	15 V	1 V	1 V	3.4	2.4	mA									
	82	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	83	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
I _{T12}	84	5.0 V	5.0 V	GND	4.6 V	4.6 V	GND	5.0 V	4.6 V	4.6 V	0.51	-0.36	-0.64									
	85	15 V	15 V	GND	4.6 V	4.6 V	GND	15 V	1 V	1 V	3.4	2.4	mA									
	86	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	87	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
I _{H1}	88	5.0 V	5.0 V	GND	4.6 V	4.6 V	GND	5.0 V	4.6 V	4.6 V	0.51	-0.36	-0.64									
	89	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	90	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	91	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	92	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	93	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	94	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
	95	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"

See footnotes at end of device type 53.

TABLE III. Group A inspection for device type 51 - Continued.

Symbol	Cases A, C,D,X,Y	For terminal conditions and limits, see <u>17</u> and <u>37</u>														Test limits			
		Subgroup 1 TA = 25°C							Subgroup 2 TA = 125°C							Subgroup 3 TA = -55°C			
		Measured terminal	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
I _{H2}	96	15 V	GND	13.5 V	GND	GND	GND	GND	15 V	GND	13.5 V	GND	13.5 V	GND	15 V	1Y	-3.4	-4.2	
	97	"	GND	15 V	GND	"	"	"	"	"	"	"	"	"	"	"	"	"	
	98	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	99	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	100	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	101	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	102	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	103	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
I _{H1}	3010	18 V	18 V	"	18 V	18 V	"	18 V	18 V	"	18 V	18 V	"	18 V	18 V	A11 inputs together	9.0	mA	
	104	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	105	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	106	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	107	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	108	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	109	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	110	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	111	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	112	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
I _{L1}	3009	113	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	GND	A11 inputs together	-8.0	"	
	114	"	18 V	GND	18 V	GND	18 V	GND	18 V	GND	18 V	GND	18 V	GND	18 V	18 V	-1.0	-4.5	
	115	"	GND	18 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	116	"	"	18 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	117	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	118	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	119	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	120	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	121	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
C _I	3012	122	3/	3/												GND	1A	12.0	
	"	123	3/	3/												"	1B	"	
	"	124	3/	3/												"	2A	"	
	"	125	3/	3/												"	3A	"	
	"	126	3/	3/												"	3B	"	
	"	127	3/	3/												"	4B	"	
	"	128	3/	3/												"	4A	"	
	"	129	3/	3/												"	"	"	

See footnotes at end of device type 53.

TABLE III. Group A inspection for device type 51 - Continued.

see footnotes at end of device type 53.

TABLE III. Group A inspection for device type 52.

Symbol	MIL-STD-883 method	Test limits												Measured terminal Subgroup 1 TA = 25°C	Measured terminal Subgroup 2 TA = 125°C	Measured terminal Subgroup 3 TA = -55°C
		For terminal conditions and limits, see <u>Y</u> and <u>Z</u>						For terminal conditions and limits, see <u>Y</u> and <u>Z</u>								
		Cases A, (C,D,X,Y)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
<u>V_IC(pos)</u>	1	1 _Y	1 _A	1 _B	1 _C	1 _D	NC	<u>V_SS</u>	NC	2 _A	2 _B	2 _C	2 _D	2 _Y	<u>V_DD</u>	
	2														GND	
	3														"	
	4														"	
	5														"	
	6														"	
	7														"	
	8														"	
<u>V_IC(neg)</u>	9															-65°C
	10															
	11															
	12															
	13															
	14															
	15															
	16															
<u>I_{SS} Y</u>	17															
	18															
	19															
	20															
	21															
<u>V_{OH4}</u>	3006	22														
	23															
	24															
	25															
	26															
	27															
	28															
	29															
<u>V_{OL4}</u>	3007	30														
	31															
<u>V_{IH1}</u>	32															
	33															
<u>V_{IH2}</u>	34															
	35															
<u>V_{IH3}</u>	36															
	37															
<u>V_{IL1}</u>	38															
	39															
	40															
	41															
	42															
	43															
	44															
	45															

See footnotes at end of device type 53.

TABLE III. Group A inspection for device type 52 - Continued.

Symbol	MIL-STD-883 Cases A, C,D,X,Y method	For terminal conditions and limits, see <u>V</u> and <u>I</u> /												Test limits															
		Subgroup 1 TA = 25°C			Subgroup 2 TA = 125°C			Subgroup 3 TA = -55°C			Measured terminal			Min			Max												
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	V _{DD}	2 _Y	2 _D	2 _C	2 _A	V _{SS}	NC	I _B	I _C	I _A	I _Y			
V _{IL2}	46	3.0 V	7.0 V	7.0 V	7.0 V	GND	GND	GND	GND	GND	10 V	1 Y	1 Y	1 Y	1 Y	9.0	9.0	9.0	9.0	9.0	9.0	9.0	V						
	47	7.0 V	7.0 V	3.0 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"						
	48	"	7.0 V	3.0 V	7.0 V	3.0 V	7.0 V	3.0 V	7.0 V	3.0 V	7.0 V	7.0 V	7.0 V	7.0 V	7.0 V	7.0 V	"	"	"	"	"	"	"						
	49	"	"	"	"	GND	GND	GND	GND	GND	3.0 V	7.0 V	7.0 V	7.0 V	7.0 V	7.0 V	7.0 V	"	"	"	"	"	"	"					
	50	"	"	"	"	"	"	"	"	"	7.0 V	3.0 V	3.0 V	3.0 V	3.0 V	3.0 V	3.0 V	"	"	"	"	"	"	"					
	51	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"						
	52	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"						
	53	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"						
V _{IL3}	54	4.0 V	11 V	11 V	11 V	GND	GND	GND	GND	GND	15 V	1 Y	1 Y	1 Y	1 Y	13.5 V	13.5 V	13.5 V	13.5 V	13.5 V	13.5 V	13.5 V	"	"	"	"	"	"	
	55	11 V	4.0 V	4.0 V	4.0 V	GND	GND	GND	GND	GND	"	"	"	"	"	"	"	"	"	"	"	"	"						
	56	"	11 V	11 V	11 V	4.0 V	GND	GND	GND	GND	4.0 V	11 V	11 V	11 V	11 V	11 V	11 V	"	"	"	"	"	"	"					
	57	"	"	"	"	GND	GND	GND	GND	GND	"	"	"	"	"	"	"	"	"	"	"	"	"						
	58	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"						
	59	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"						
	60	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"						
	61	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"						
I _{OL1}	62	0.4 V	5.0 V	5.0 V	5.0 V	GND	GND	GND	GND	GND	5.0 V	5.0 V	GND	GND	GND	5.0 V	5.0 V	0.4 V	GND	GND	GND	GND	0.51 V	0.36 V	0.64 mA	mA			
	63	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"						
I _{OL2}	64	1.5 V	15 V	15 V	15 V	GND	GND	GND	GND	GND	15 V	15 V	GND	GND	GND	15 V	15 V	1.5 V	GND	GND	GND	GND	3.4 V	2.4 V	4.2 mA	mA			
I _{OH1}	66	4.6 V	"	5.0 V	5.0 V	GND	GND	GND	GND	GND	"	"	GND	GND	GND	"	"	"	GND	GND	GND	GND	5.0 V	5.0 V	-0.51 V	-0.36 V	-0.64 V		
	67	"	"	5.0 V	5.0 V	GND	GND	GND	GND	GND	"	"	"	"	"	"	"	"	"	"	"	"	"						
	68	"	"	"	"	GND	GND	GND	GND	GND	"	"	"	"	"	"	"	"	"	"	"	"	"						
	69	"	"	"	"	GND	GND	GND	GND	GND	"	"	"	"	"	"	"	"	"	"	"	"	"						
	70	"	"	"	"	GND	GND	GND	GND	GND	"	"	"	"	"	"	"	"	"	"	"	"	"						
	71	"	"	"	"	GND	GND	GND	GND	GND	"	"	"	"	"	"	"	"	"	"	"	"	"						
	72	"	"	"	"	GND	GND	GND	GND	GND	"	"	"	"	"	"	"	"	"	"	"	"	"						
	73	"	"	"	"	GND	GND	GND	GND	GND	"	"	"	"	"	"	"	"	"	"	"	"	"						
I _{OH2}	74	13.5 V	"	15 V	15 V	GND	GND	GND	GND	GND	15 V	15 V	GND	GND	GND	15 V	15 V	15 V	GND	GND	GND	GND	15 V	15 V	-3.4 V	-2.4 V	-4.2 V		
	75	"	"	15 V	15 V	GND	GND	GND	GND	GND	"	"	"	"	"	"	"	"	"	"	"	"	"						
	76	"	"	"	"	GND	GND	GND	GND	GND	"	"	"	"	"	"	"	"	"	"	"	"	"						
	77	"	"	"	"	GND	GND	GND	GND	GND	"	"	"	"	"	"	"	"	"	"	"	"	"						
	78	"	"	"	"	GND	GND	GND	GND	GND	"	"	"	"	"	"	"	"	"	"	"	"	"						
	79	"	"	"	"	GND	GND	GND	GND	GND	"	"	"	"	"	"	"	"	"	"	"	"	"						
	80	"	"	"	"	GND	GND	GND	GND	GND	"	"	"	"	"	"	"	"	"	"	"	"	"						
	81	"	"	"	"	GND	GND	GND	GND	GND	"	"	"	"	"	"	"	"	"	"	"	"	"						
I _{H1}	3010	18 V	18 V	18 V	18 V	18 V	18 V	18 V	18 V	18 V	18 V	18 V	18 V	18 V	18 V	18 V	18 V	18 V	18 V	18 V	18 V	18 V	18 V	8.0	8.0	mA			
	2	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"						
I _{H2}	82	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"						
	83	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"						
	84	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"						
	85	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"						
	86	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"						
	87	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"						
	88	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"						
	89	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"						
	90	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"						

See footnotes at end of device type 53.

TABLE III. Group A inspection for device type 52 - Continued.

Symbol	MIL-STD-883 method	For terminal conditions and limits, see <u>11</u> and <u>37</u>												Test limits				
		Cases A, C,D,X,Y						Subgroup 1 TA = 25°C						Subgroup 2 TA = 125°C		Subgroup 3 TA = -55°C		
		Test no.	1Y	1A	1B	1C	1D	NC	VSS	NC	2A	2B	2D	2Y	VDD	GND	18 V	nA
I1L1 2/	3009	91																
I1L2	"	92	"	18 V	18 V	18 V	"	"	"	"	18 V	18 V	18 V	"	"		-45	
	"	93	"	18 V	GND	GND	"	"	"	"	"	"	"	"	"	1A	"	
	"	94	"	"	"	"	"	"	"	"	"	"	"	"	"	1B	"	
	"	95	"	"	"	"	"	"	"	"	"	"	"	"	"	1C	"	
	"	96	"	"	"	"	"	"	"	"	"	"	"	"	"	1D	"	
	"	97	"	"	"	"	"	"	"	"	"	"	"	"	"	2A	"	
	"	98	"	"	"	"	"	"	"	"	"	"	"	"	"	2B	"	
	"	99	"	"	"	"	"	"	"	"	"	"	"	"	"	2C	"	
																2D	"	
Subgroup 4 TA = 25°C																		
C1	3012	100		3/												GND	12.0	
	"	101		3/												1A	"	
	"	102		3/												1B	"	
	"	103		3/												1C	"	
	"	104		3/												1D	"	
	"	105		3/												2A	"	
	"	106		3/												2B	"	
	"	107		3/												2C	"	
																2D	"	
Subgroup 9 TA = 25°C																		
tPHL	3003 Fig. 5	108	OUT	IN	5.0 V	5.0 V	5.0 V	GND			5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	5.0 V	
	"	109	"	"	"	"	"	"			"	"	"	"	"	1Y	"	
	"	110	"	"	"	"	"	"			"	"	"	"	"	1Y	"	
	"	111	"	"	"	"	"	"			"	"	"	"	"	1Y	"	
	"	112	"	"	"	"	"	"			"	"	"	"	"	2Y	"	
	"	113	"	"	"	"	"	"			"	"	"	"	"	2Y	"	
	"	114	"	"	"	"	"	"			"	"	"	"	"	2Y	"	
	"	115	"	"	"	"	"	"			"	"	"	"	"	2Y	"	
Subgroup 10 TA = 125°C																		
tPLH1	"	116	OUT	IN	"	"	"	"			"	"	"	"	"	1Y	"	
	"	117	"	5.0 V	IN	"	"	"			"	"	"	"	"	1Y	"	
	"	118	"	"	5.0 V	IN	"	"			"	"	"	"	"	1Y	"	
	"	119	"	"	"	5.0 V	IN	"			"	"	"	"	"	1Y	"	
	"	120	"	"	"	"	5.0 V	IN			"	"	"	"	"	2Y	"	
	"	121	"	"	"	"	"	5.0 V			"	"	"	"	"	2Y	"	
	"	122	"	"	"	"	"	"			"	"	"	"	"	2Y	"	
	"	123	"	"	"	"	"	"			"	"	"	"	"	2Y	"	

See footnotes at end of device type 53.

TABLE III. Group A inspection for device type 52 - Continued.

Symbol	STD-883 MIL-method	For terminal conditions and limits, see <u>Fig. 5</u> and <u>3</u>												Test limits										
		Cases A, C,D,X,Y						Measured terminal						Subgroup 9 TA = 25°C			Subgroup 10 TA = 125°C			Subgroup 11 TA = -55°C				
		Test no.	1Y	1A	1B	1C	1D	NC	V _{SS}	NC	2A	2B	2C	2D	2Y	V _{DD}	5.0 V	1Y	28	550	41	825	28	550
t _{THL}	Fig. 5	124	OUT	IN	5.0 V	5.0 V	GND									5.0 V	1Y	28	550	41	825	28	550	ns
		125	"	5.0 V	"	"	"									5.0 V	1Y	28	550	41	825	28	550	ns
		126	"	"	5.0 V	IN	"									5.0 V	1Y	28	550	41	825	28	550	ns
		127	"	"	"	5.0 V	5.0 V									5.0 V	1Y	28	550	41	825	28	550	ns
		128	"	"	"	"	5.0 V									5.0 V	1Y	28	550	41	825	28	550	ns
		129	"	"	"	"	"									5.0 V	1Y	28	550	41	825	28	550	ns
		130	"	"	"	"	"									5.0 V	1Y	28	550	41	825	28	550	ns
		131	"	"	"	"	"									5.0 V	1Y	28	550	41	825	28	550	ns
		132	OUT	IN	"	"	"									5.0 V	1Y	28	550	41	825	28	550	ns
		133	"	5.0 V	IN	"	"									5.0 V	1Y	28	550	41	825	28	550	ns
t _{TILH}		134	"	5.0 V	5.0 V	IN	"									5.0 V	1Y	28	550	41	825	28	550	ns
		135	"	"	"	5.0 V	IN	"								5.0 V	1Y	28	550	41	825	28	550	ns
		136	"	"	"	"	5.0 V									5.0 V	1Y	28	550	41	825	28	550	ns
		137	"	"	"	"	"									5.0 V	1Y	28	550	41	825	28	550	ns
		138	"	"	"	"	"									5.0 V	1Y	28	550	41	825	28	550	ns
		139	"	"	"	"	"									5.0 V	1Y	28	550	41	825	28	550	ns

See footnotes at end of device type 53.

TABLE III. Group A inspection for device type 53.

Symbol	MIL-STD-883 method	Cases A, C,D,X,Y	For terminal conditions $\frac{V}{I}$												Test limits									
			Subgroup 1				Subgroup 2				Subgroup 3				Measured terminal		Subgroup 1		Subgroup 2		Subgroup 3			
			Test no.	2A	2B	1A	1B	1C	1Y	V _{SS}	2C	2Y	3Y	3A	3B	3C	V _{DD}	Min	Max	Min	Max	Min	Max	
$V_{IC}(pos)$	1	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	GND	2A	1.5	2B	1.5	2C	1.5	
	2	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	1 mA	GND	1A	1.5	1B	1.5	1C	1.5	
	3	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	2B	1.5	2C	1.5	2D	1.5	
	4	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	1A	1.5	1B	1.5	1C	1.5	
	5	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	1B	1.5	1C	1.5	1D	1.5	
	6	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	3A	1.5	3B	1.5	3C	1.5	
	7	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	3B	1.5	3C	1.5	3D	1.5	
	8	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	2A	1.5	2B	1.5	2C	1.5	
	9	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	1A	1.5	1B	1.5	1C	1.5	
$V_{IC}(neg)$	10	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	-1 mA	GND	2A	-6.0	2B	-6.0	2C	-6.0	
	11	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	2B	"	2C	"	2D	"	
	12	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	1A	"	1B	"	1C	"	
	13	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	1B	"	1C	"	1D	"	
	14	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	3A	"	3B	"	3C	"	
	15	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	3B	"	3C	"	3D	"	
	16	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	2A	"	2B	"	2C	"	
	17	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	1A	"	1B	"	1C	"	
	18	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	1B	"	1C	"	1D	"	
$I_{SS} \frac{V}{I}$	19	GND	18 V	GND	18 V	GND	18 V	GND	18 V	GND	18 V	GND	18 V	GND	18 V	GND	18 V	18 V	18 V	18 V	18 V	18 V	18 V	
	20	"	18 V	"	18 V	"	18 V	"	18 V	"	18 V	"	18 V	"	18 V	"	18 V	"	"	"	"	"	"	"
	21	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	"	"	"	"	"	"	"
	22	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	"	"	"	"	"	"	"
	23	GND	15 V	GND	15 V	GND	15 V	GND	15 V	GND	15 V	GND	15 V	GND	15 V	GND	15 V	GND	15 V	2Y	2Y	2Y	2Y	2Y
	24	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	"	"	"	"	"	"	"
	25	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	"	"	"	"	"	"	"
	26	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	"	"	"	"	"	"	"
	27	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	"	"	"	"	"	"	"
V_{OH4}	28	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	"	"	"	"	"	"	"
	29	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	"	"	"	"	"	"	"
	30	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	"	"	"	"	"	"	"
	31	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	"	"	"	"	"	"	"
	32	GND	15 V	GND	15 V	GND	15 V	GND	15 V	GND	15 V	GND	15 V	GND	15 V	GND	15 V	GND	15 V	2Y	2Y	2Y	2Y	2Y
	33	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	"	"	"	"	"	"	"
	34	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	"	"	"	"	"	"	"
	35	3.5 V	3.5 V	GND	3.5 V	GND	3.5 V	GND	3.5 V	GND	3.5 V	GND	3.5 V	GND	3.5 V	GND	3.5 V	GND	3.5 V	2Y	2Y	2Y	2Y	2Y
	36	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	"	"	"	"	"	"	"
V_{IH1}	37	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	"	"	"	"	"	"	"
	38	7.0 V	7.0 V	GND	7.0 V	GND	7.0 V	GND	7.0 V	GND	7.0 V	GND	7.0 V	GND	7.0 V	GND	7.0 V	GND	7.0 V	2Y	2Y	2Y	2Y	2Y
	39	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	"	"	"	"	"	"	"
	40	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	"	"	"	"	"	"	"
	41	11 V	11 V	GND	11 V	GND	11 V	GND	11 V	GND	11 V	GND	11 V	GND	11 V	GND	11 V	GND	11 V	2Y	2Y	2Y	2Y	2Y
	42	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	"	"	"	"	"	"	"
	43	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	GND	"	"	"	"	"	"	"

See footnotes at end of device type 53.

TABLE III. Group A inspection for device type 53 - Continued.

Symbol	MIL-STD-883 method	Cases A, C,D,X,Y	For terminal conditions $\frac{1}{T}$												Test limits					
			Subgroup 1				Subgroup 2				Subgroup 3				Unit					
			TA = 25°C		TA = 125°C		TA = 25°C		TA = 125°C		TA = 25°C		TA = 125°C		Min		Max			
Test no.			1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal			
V _{T11}	44	1.5 V	3.5 V	GND	GND	GND	GND	3.5 V	"	GND	GND	5 V	2Y	2Y	4.5	4.5	Y			
	45	3.5 V	1.5 V	"	"	"	"	"	"	GND	"	"	"	"	"	"	"			
	46	"	3.5 V	GND	GND	1.5 V	"	"	"	"	"	"	"	"	"	"	"			
	47	GND	"	"	3.5 V	3.5 V	GND	"	"	"	"	"	"	"	"	"	"			
	48	"	"	3.5 V	1.5 V	"	GND	"	"	"	"	"	"	"	"	"	"			
	49	"	"	"	3.5 V	1.5 V	GND	"	"	"	"	"	"	"	"	"	"			
	50	"	"	"	"	GND	"	"	"	"	"	"	"	"	"	"	"			
	51	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"			
	52	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"			
V _{T12}	53	3.0 V	7.0 V	"	"	"	"	"	"	7.0 V	GND	GND	10 V	2Y	2Y	9.0	9.0	Y		
	54	7.0 V	3.0 V	GND	GND	3.0 V	"	"	"	"	3.0 V	GND	"	"	"	"	"	"		
	55	"	"	GND	3.0 V	7.0 V	"	"	"	"	"	"	"	"	"	"	"	"		
	56	GND	"	"	7.0 V	3.0 V	GND	"	"	"	"	"	"	"	"	"	"	"		
	57	"	"	"	"	GND	GND	GND	"	"	"	"	"	"	"	"	"	"		
	58	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
	59	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
	60	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
	61	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"		
V _{T13}	62	4.0 V	11 V	4.0 V	"	"	"	"	"	"	11 V	GND	GND	15 V	2Y	2Y	13.5	13.5	Y	
	63	11 V	11 V	GND	GND	4.0 V	11 V	11 V	"	"	4.0 V	GND	"	"	"	"	"	"	"	
	64	"	"	"	"	11 V	4.0 V	4.0 V	"	"	"	"	"	"	"	"	"	"	"	
	65	GND	"	"	"	GND	GND	GND	"	"	"	"	"	"	"	"	"	"	"	
	66	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	67	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	68	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	69	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	70	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
I _{O11}	71	5.0 V	5.0 V	"	"	"	5.0 V	0.4 V	"	GND	GND	GND	5 V	2Y	2Y	0.51	0.51	mA		
	72	GND	GND	"	5.0 V	5.0 V	GND	GND	"	0.4 V	5.0 V	5.0 V	5.0 V	2Y	2Y	0.51	0.51	mA		
	73	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
I _{O12}	74	15 V	15 V	GND	15 V	15 V	GND	GND	"	1.5 V	1.5 V	1.5 V	15 V	2Y	2Y	4.2	4.2	mA		
	75	GND	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	76	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
I _{OH1}	77	"	5.0 V	GND	5.0 V	"	"	"	"	5.0 V	4.6 V	GND	GND	5 V	2Y	2Y	-0.36	-0.36	mA	
	78	"	5.0 V	5.0 V	GND	GND	5.0 V	5.0 V	4.6 V	"	"	GND	"	"	2Y	2Y	"	"	"	
	79	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	80	GND	GND	"	"	"	GND	GND	"	"	"	"	"	"	"	"	"	"	"	
	81	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	82	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	83	GND	GND	"	"	"	GND	GND	"	"	"	"	"	"	"	"	"	"	"	
	84	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	85	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
I _{OH2}	86	"	15 V	GND	15 V	"	"	"	"	15 V	13.5 V	GND	GND	GND	2Y	2Y	-2.4	-2.4	mA	
	87	"	15 V	GND	15 V	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	88	GND	GND	"	"	"	GND	GND	"	"	"	"	"	"	"	"	"	"	"	
	89	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	90	"	"	"	"	"	GND	GND	"	"	"	"	"	"	"	"	"	"	"	
	91	"	"	"	"	"	GND	GND	"	"	"	"	"	"	"	"	"	"	"	
	92	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	93	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	94	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	

See footnotes at end of device type 53.

TABLE III. Group A inspection for device type 53 - Continued.

Symbol	MIL-STD-883 method	Cases A, C,D,X,Y	For terminal conditions 17												Test limits			
			Subgroup 1				Subgroup 2				Subgroup 3				Measured terminal	Unit		
			TA = 25°C	TA = 125°C	TA = -55°C	TA = -55°C	Min	Max	Min	Max	Min	Max	Min	Max				
I _{1M1 2/}	3010	95	18.0 V	18.0 V	18.0 V	18.0 V	GND	18.0 V	18.0 V	18.0 V	18.0 V	18.0 V	18.0 V	All together	9.0			
I _{1M2}	"	96	"	"	"	"	"	"	"	"	"	"	"	2A	1.0	45.0	"	"
I _{1M2}	"	97	"	"	"	"	"	"	"	"	"	"	"	2B	"	"	"	"
I _{1M2}	"	98	"	"	"	"	"	"	"	"	"	"	"	2C	"	"	"	"
I _{1M2}	"	99	"	"	"	"	"	"	"	"	"	"	"	1A	"	"	"	"
I _{1M2}	"	100	"	"	"	"	"	"	"	"	"	"	"	1B	"	"	"	"
I _{1M2}	"	101	"	"	"	"	"	"	"	"	"	"	"	1C	"	"	"	"
I _{1M2}	"	102	"	"	"	"	"	"	"	"	"	"	"	3A	"	"	"	"
I _{1M2}	"	103	"	"	"	"	"	"	"	"	"	"	"	3B	"	"	"	"
I _{1M2}	"	104	"	"	"	"	"	"	"	"	"	"	"	3C	"	"	"	"
I _{1M1 2/}	3009	105	GND	GND	GND	GND	"	GND	GND	GND	GND	GND	GND	All together	-9.0			
I _{1M2}	"	106	"	18.0 V	18.0 V	18.0 V	18.0 V	"	"	18.0 V	18.0 V	18.0 V	18.0 V	2A	-1.0	45.0	"	"
I _{1M2}	"	107	18.0 V	"	18.0 V	"	18.0 V	"	GND	"	18.0 V	"	"	2B	"	"	"	"
I _{1M2}	"	108	"	"	18.0 V	"	"	"	"	18.0 V	"	"	"	2C	"	"	"	"
I _{1M2}	"	109	"	"	"	18.0 V	"	GND	"	"	18.0 V	"	"	1A	"	"	"	"
I _{1M2}	"	110	"	"	"	"	18.0 V	GND	"	"	"	18.0 V	"	1B	"	"	"	"
I _{1M2}	"	111	"	"	"	"	"	18.0 V	GND	"	"	"	"	1C	"	"	"	"
I _{1M2}	"	112	"	"	"	"	"	"	18.0 V	"	"	"	"	3A	"	"	"	"
I _{1M2}	"	113	"	"	"	"	"	"	"	18.0 V	"	"	"	3B	"	"	"	"
I _{1M2}	"	114	"	"	"	"	"	"	"	"	18.0 V	"	"	3C	"	"	"	"
C ₁	3012	115	3/	3/	GND	"	"	"	"	"	"	"	"	GND	12.0			
C ₁	"	116	3/	3/	GND	"	"	"	"	"	"	"	"	2A	"			
C ₁	"	117	3/	3/	GND	"	"	"	"	"	"	"	"	2B	"			
C ₁	"	118	3/	3/	GND	"	"	"	"	"	"	"	"	1A	"			
C ₁	"	119	3/	3/	GND	"	"	"	"	"	"	"	"	1B	"			
C ₁	"	120	3/	3/	GND	"	"	"	"	"	"	"	"	1C	"			
C ₁	"	121	3/	3/	GND	"	"	"	"	"	"	"	"	3A	"			
C ₁	"	122	3/	3/	GND	"	"	"	"	"	"	"	"	3B	"			
C ₁	"	123	3/	3/	GND	"	"	"	"	"	"	"	"	3C	"			
t _{PHL}	Fig. 5	124	IN	5.0 V	5.0 V	5.0 V	5.0 V	GND	5.0 V	OUT	5.0 V	5.0 V	5.0 V	2A	175			
t _{PHL}	Fig. 5	125	5.0 V	"	5.0 V	"	"	"	IN	"	"	"	"	2B	"			
t _{PHL}	Fig. 5	126	5.0 V	"	5.0 V	"	"	"	5.0 V	"	"	"	"	1Y	"			
t _{PHL}	Fig. 5	127	5.0 V	"	5.0 V	"	"	"	5.0 V	"	"	"	"	1Y	"			
t _{PHL}	Fig. 5	128	5.0 V	"	5.0 V	"	"	"	5.0 V	"	"	"	"	3Y	"			
t _{PHL}	Fig. 5	129	5.0 V	"	5.0 V	"	"	"	5.0 V	"	"	"	"	3Y	"			
t _{PHL}	Fig. 5	130	5.0 V	"	5.0 V	"	"	"	5.0 V	"	"	"	"	3Y	"			
t _{PHL}	Fig. 5	131	5.0 V	"	5.0 V	"	"	"	5.0 V	"	"	"	"	3Y	"			
t _{PHL}	Fig. 5	132	5.0 V	"	5.0 V	"	"	"	5.0 V	"	"	"	"	3Y	"			

See footnotes at end of device type 53.

TABLE III. Group A inspection for device type 53 - Continued.

Symbol	MIL-STD-883 method	Cases A, C,D,X,Y	For terminal conditions <u>1/</u>												Test limits							
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Subgroup 9 TA = 25°C	Subgroup 10 TA = 125°C	Subgroup 11 TA = -55°C	Unit	
			2A	2B	1A	1B	1C	1Y	V _{SS}	2C	2Y	3Y	3A	3B	3C	V _{DD}	Min	Max	Min	Max		
t _{PLH}	F19-5	133 134 135 136 137 138 139 140 141	5.0 V IN 5.0 V IN 5.0 V IN 5.0 V IN 5.0 V IN	5.0 V IN 5.0 V IN 5.0 V IN 5.0 V IN 5.0 V IN	5.0 V " " " " " "	5.0 V " " " " " "	GND " " " " " "	5.0 V " " " " " "	OUT " " " " " "	" " " " " "	" " " " " "	" " " " " "	5.0 V " " " " " "	5.0 V " " " " " "	5.0 V " " " " " "	2Y " " " " " "	8 " " " " " "	150 "	11 "	225 "	8 "	150 "
t _{TTLH}	F19-5	142 143 144 145 146 147 148 149 150	5.0 V IN 5.0 V IN 5.0 V IN 5.0 V IN 5.0 V IN	5.0 V IN 5.0 V IN 5.0 V IN 5.0 V IN 5.0 V IN	5.0 V " " " " " "	5.0 V " " " " " "	IN " " " " " "	5.0 V " " " " " "	OUT " " " " " "	" " " " " "	" " " " " "	" " " " " "	5.0 V "	5.0 V "	5.0 V "	2Y "	13 "	250 "	19 "	375 "	13 "	250 "
t _{TTLH}		151 152 153 154 155 156 157 158 159	5.0 V IN 5.0 V IN 5.0 V IN 5.0 V IN 5.0 V IN	5.0 V IN 5.0 V IN 5.0 V IN 5.0 V IN 5.0 V IN	5.0 V " " " " " "	5.0 V "	IN "	5.0 V "	OUT "	" "	" "	" "	5.0 V " " " " " " " " " " " " " " " " " "	5.0 V " " " " " " " " " " " " " " "	5.0 V " " " " " " " " " " " "	2Y " " " " " " " " " " " " " " " " " "	15 " " " " " " " " " " " " " " "	300 " " " " " " " " "	25 " " "	450 " " "	12 " " "	300 " " "

1/ Pins not designated may be "High" level logic, "Low" level logic, or open. Exceptions are as follows:

- a. V_IC(pos) tests, the V_{SS} terminal shall be open.
- b. V_I(neg) tests, the V_{DD} terminal shall be open.
- c. ISS tests, the output terminal shall be open.

2/ The device manufacturer may at his option measure I_{IL} and I_{IH} at 25°C for each individual input or measure all inputs together.

3/ See 4.4.c.

4.4.2 Group B inspection. Group B inspection shall be in accordance with table II of method 5005 of MIL-STD-883 and as follows:

- a. Class S steady state life (accelerated) test circuits shall be submitted to the qualifying activity for approval. When the alternate steady state life test is used, the circuit on figure 4, or equivalent, shall be used.
- b. A special subgroup shall be added using an LTPD of 15 for classes S and B, and shall be performed on each inspection lot for initially qualified device types 01, 02, 03, and measured only for initial qualification and after process or design changes for initially qualified device types 51, 52, 53. This subgroup shall consist of a high voltage test of the input protection circuits, VZAP (see 4.5.3).
- c. End-point electrical parameters shall be as specified in table II herein and shall consist of those subgroups specified in table IIa of test method 5005 of MIL-STD-883. Delta limits shall apply only to subgroup 5 of group B inspections and shall consist of tests specified in table IV herein.

4.4.3 Group C inspection. Group C inspection shall be in accordance with table III of method 5005 of MIL-STD-883 and as follows:

- a. End-point electrical parameters shall be as specified in table II herein. Delta limits shall apply only to subgroup 1 of group C inspection and shall consist of tests specified in table IV herein.
- b. Steady-state life test (method 1005 of MIL-STD-883) conditions:
 - (1) Test condition D and as specified in 4.5.2 and as shown on figure 4, or equivalent.
 - (2) $T_A = +125^\circ\text{C}$ minimum.
 - (3) Test duration, 1,000 hours, except as permitted by appendix B of MIL-M-38510 and method 1005 of MIL-STD-883.
- c. Subgroups 3 and 4 shall be added to the group C inspection requirements for class B devices, and shall consist of the tests, conditions, and limits as specified for subgroups 10 and 11 of group A.

4.4.4 Group D inspection. Group D inspection shall be in accordance with table IV of method 5005 of MIL-STD-883. End-point electrical parameters shall be as specified in table II herein.

4.4.5 Group E inspection. Group E inspection is required only for device types intended to be marked as radiation hardened (see 3.6.1). When group E testing is performed it shall be in accordance with table V of method 5005 of MIL-STD-883 and 4.5.5 herein.

4.5 Methods of inspection. Methods of inspection shall be specified as follows:

4.5.1 Voltage and current. All voltages given are referenced to the microcircuit V_{SS} terminal, unless otherwise specified. Currents given are conventional current and positive when flowing into the referenced terminal.

4.5.2 Burn-in and life test cool down procedures. When these tests are completed and prior to removal of bias voltages, the devices under test (DUT) shall be cooled to a temperature of $25^\circ\text{C} \pm 3^\circ\text{C}$; then, electrical parameter end-point measurements shall be performed.

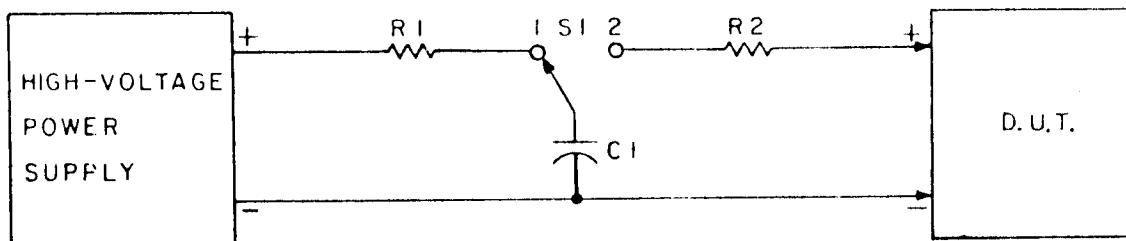
TABLE IV. Delta limits @25°C.

Parameter 1/	Device types	
	01, 02, 03	51, 52, 53
ISS	±10 nA	±10 nA
VOL1	±.04 V	---
VOH1	±.08 V	---
IOL1	---	±15%
IOH1	---	±15%

1/ Each of the above parameters shall be recorded before and after the required burn-in and life tests to determine delta's (Δ).

4.5.3 High voltage (V_{ZAP}) test of input protection circuits. All input terminals (up to a maximum of 4) of the DUT shall be subjected to a voltage pulse from a 100 pF source charged to 400 V. This destructive test shall be conducted as follows using the test circuit on figure 6.

- a. Measure I_{IL} and I_{IH} at the inputs selected, as stated above, at 25°C. The test limit for each input tested shall be ±10 nA at the specified V_{DD} . Measure I_{SS} on the DUT at 25°C. The test limit for this measurement shall be increased a maximum of 20 percent of the specified I_{SS} table III limit at the specified V_{DD} .



$$V_{ZAP} = 400 \text{ V minimum charge on } C_1$$

$$1 \text{ M}\Omega < R_1 < 50 \text{ M}\Omega$$

$$R_2 = 1.5 \text{ k}\Omega$$

$$C_1 = 100 \text{ pF}$$

S1 = Hg-wetted "bounceless" relay

FIGURE 6. High voltage (V_{ZAP}) test circuits.

- b. V_{ZAP} is applied to DUT in the following modes (see table V) by changing C_1 to V_{ZAP} with S1 in position 1 and then switching to position 2.

TABLE V. Modes for high voltage test.

Mode	+ Terminal	- Terminal
1	V_{DD}	Input
2	Input	V_{SS}
3	Input	Associated output

c. Within 24 hours repeat the I_{SS} , I_{IL} , and I_{IH} measurements on the same terminals as performed above. If a DUT exhibits leakage currents in excess of the specified limits after the V_{ZAP} test, it shall be classified as a failure.

4.5.4 Quiescent supply current (I_{SS} test). When performing quiescent supply current measurements (I_{SS}), the meter shall be placed so that all currents flow through the meter.

4.5.5 Radiation hardness assurance (RHA) testing. The RHA testing shall be performed in accordance with test procedures and sampling specified in table V of method 5005 of MIL-STD-883 and herein:

- a. Before irradiation, selected samples shall be assembled in qualified packages and pass the governing electrical parameters (group A subgroup 1 at 25°C) and also be subjected to the threshold-voltage test in table VIII in order to calculate the delta threshold (ΔV_T) after irradiation.
- b. The devices shall be subjected to a total radiation dose as specified in MIL-M-38510 for the radiation hardness assurance (RHA) level being tested, and meet the end-point electrical parameters as defined in table VI at 25°C, after exposure. The start and completion of the end-point electrical parameter measurements shall not exceed 2 hours following irradiation.
- c. Threshold-voltage test circuit conditions shall be as specified in table VIII and figure 7. In situ and remote testing, the tests shall be performed with the devices biased in accordance with table VII and bias may be interrupted for up to 1 minute to remove devices to the remote bias fixture.
- d. After irradiation, the devices shall pass the truth table test as specified in subgroup 7 in table III or if subgroup 7 is not required, then an equivalent truth table test shall be performed.

TABLE VI. Radiation hardening end-point electrical parameters at 25°C.

Parameter	All device types	V_{DD}	
		Device types	
		01-03	51-53
V_{TN}	0.3 V min	10 V	10 V
V_{TP}	2.8 V max	10 V	10 V
ΔV_T	1.4 V max	10 V	10 V
I_{SS}	100 x max limit	15 V	18 V
t_{PLH}	1.35 x max limit	5 V	5 V
t_{PHL}	1.35 x max limit	5 V	5 V

TABLE VII. Bias during exposure to radiation.

Device type	Pin connections		
	$V_{DD} = 10$ V dc (through a 30- to 60 kilohm resistor)	$V_{SS} = GND$	$V_{DD} = 10$ V dc
01, 51	1, 2, 5, 6, 8, 9, 12, 13	7	14
02, 52	2, 3, 4, 5, 9, 10, 11, 12	7	14
03, 53	1, 2, 3, 4, 5, 8, 11, 12, 13	7	14

Pins not designated are open or connected to 10 V dc through a 30- to 60 kilohm resistor.

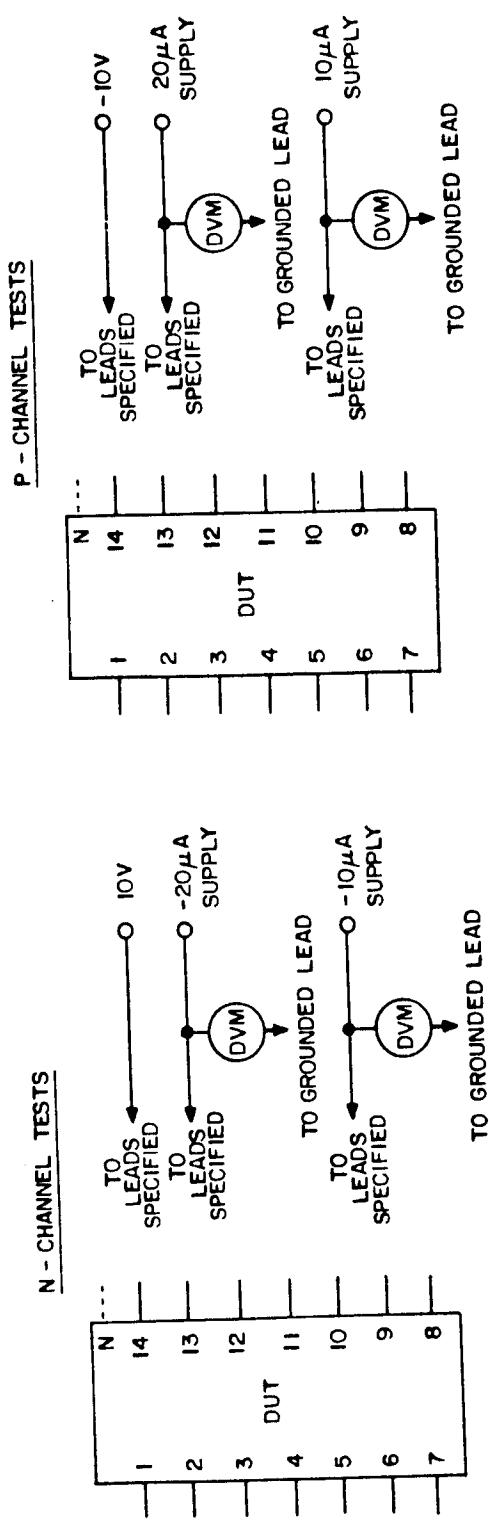


FIGURE 7. Threshold voltage test circuit.

TABLE VIII. Threshold - voltage test circuit conditions.

Device type	GND	10 V	V _{TN} measured at			V _{TP} measured at
			-20 μA supply	-10 μA supply	GND	
01, 51	2	1, 14		5-9, 12, 13	2 13 5-9, 12	1, 14
02, 52	2	3-5, 14		7, 9-12	2 7, 9-12	3-5, 14
03, 53	3	4, 5, 14		1, 2, 7, 8, 11-13	3 1, 2, 7, 8, 11-13	4, 5, 14

4.6 Data reporting. When specified in the purchase order or contract, a copy of the following data, as applicable, shall be supplied.

- a. Attributes data for all screening tests (see 4.2) and variables data for all static burn-in, dynamic burn-in, and steady state life tests (see 3.5).
- b. A copy of each radiograph.
- c. The quality conformance inspection data (see 4.4).
- d. Parameter distribution data on parameters evaluated during burn-in (see 3.5).
- e. Final electrical parameters data (see 4.2c).

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510.

6. NOTES

6.1 Intended use. Microcircuits conforming to this specification are intended for original equipment design applications and logistic support of existing equipment.

6.2 Ordering data. The acquisition document should specify the following:

- a. Complete part number (see 1.2).
- b. Requirements for delivery of one copy of the quality conformance inspection data pertinent to the device inspection lot to be supplied with each shipment by the device manufacturer, if applicable.
- c. Requirements for certificate of compliance, if applicable.
- d. Requirements for notification of change of product or process to the contracting activity in addition to notification to the qualifying activity, if applicable.
- e. Requirements for failure analysis (including required test condition of method 5003 of MIL-STD-883), corrective action and reporting of results, if applicable.
- f. Requirements for product assurance options.
- g. Requirements for special carriers, lead lengths, or lead forming, if applicable. These requirements shall not affect the part number. Unless otherwise specified, these requirements shall not apply to direct purchase by or direct shipment to the Government.
- h. Requirements for "JAN" marking.
- i. Requirements for total dose radiation testing (see 3.6.1 and 4.5.5), if applicable.

6.3 Abbreviations, symbols, and definitions. The abbreviations, symbols, and definitions used herein are defined in MIL-M-38510, MIL-STD-1331, and as follows:

C_i	- - - - -	Input terminal-to-V _{SS} capacitance.
GND	- - - - -	Ground. Zero voltage potential.
I _{SS}	- - - - -	Quiescent supply current.
T _A	- - - - -	Free air temperature.
V _{DD}	- - - - -	Positive supply voltage.
V _{SS}	- - - - -	Negative supply voltage.
V _{ZAP}	- - - - -	Input test voltage.

6.4 Logistic support. Lead materials and finishes (see 3.3) are interchangeable. Unless otherwise specified, microcircuits acquired for Government logistic support will be acquired to device class S for National Aeronautics and Space Administration or class B for Department of Defense (see 1.2.2), lead finish C (see 3.3). Longer length leads and lead forming shall not affect the part number.

6.5 Substitutability. The cross-reference information below is presented for the convenience of users. Microcircuits covered by this specification will functionally replace the listed generic-industry type. Generic-industry microcircuit types may not have equivalent operational performance characteristics across military temperature ranges or reliability factors equivalent to MIL-M-38510 device types and may have slight physical variations in relation to case size. The presence of this information shall not be deemed as permitting substitution of generic-industry types for MIL-M-38510 types or as a waiver of any of the provisions of MIL-M-38510.

Military device type	Generic-industry type
01	4011A
02	4012A
03	4023A
51	4011B
52	4012B
53	4023B

6.6 Handling. MOS devices must be handled with certain precautions to avoid damage due to accumulation of static charge. Input protective devices have been designed in the chip to minimize the effect of this static build up. However, the following handling practices are recommended:

- a. Devices should be handled on benches with conductive and grounded surface.
- b. Ground test equipment and tools.
- c. Do not handle devices by the leads.
- d. Store devices in conductive foam or carriers.
- e. Avoid use of plastic, rubber, or silk in MOS areas.
- f. Maintain relative humidity above 50 percent, if practical.

6.7 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue, due to the extensiveness of the changes.

Custodians:

Army - ER
Navy - EC
Air Force - 17
NASA - NA

Preparing activity:

NASA - NA

(Project 5962-0634)

Review activities:

Army - MI
Air Force - 11, 19, 85, 99
DLA - ES

User activities:

Army - SM, AR
Navy - AS, CG, OC, MC, SH

Agent:

DLA - ES